Hochschule Neubrandenburg
University of Applied Sciences

Fachbereich Landschaftswissenschaften und Geomatik

Studiengang Geodäsie und Geoinformatik

Erarbeitung der Implementierung der ISO/TS 19159-1 “Calibration and validation of remote sensing imagery sensors“

Masterarbeit

vorgelegt von

MAGDALENA FIRLEJ

am 22.09.2015

Zum Erlangen des akademischen Grades

„Master of Engineering” (M.Eng.)

Erstprüfer: Prof. Dr.-Ing. Wolfgang Kresse

Zweitprüfer: Prof. Dr.-Ing. Hans Jürgen Larisch

urn:nbn:de:gbv:519-thesis2015-0037-4

Eidesstattliche Erklärung

Hiermit versichere ich, die vorliegende Masterarbeit ohne Hilfe Dritter und nur mit den angegebenen Quellen und Hilfsmitteln angefertigt zu haben. Alle Stellen, die aus den Quellen entnommen wurden, sind als solche kenntlich gemacht worden. Diese Arbeit hat in gleicher oder ähnlicher Form noch keiner Prüfungsbehörde vorgelegen.

Neubrandenburg, den 22.09.2015

Magdalena Firlej

Danksagung

An dieser Stelle möchte ich mich bei allen bedanken, die mich während der Entstehung dieser Masterarbeit unterstützt und motiviert haben.

Mein besonderer Dank gilt den Rotary Club Neubrandenburg, der mich während meines Masterstudiums in Deutschland finanziell unterstützt hat.

Ich möchte mich auch bei Prof. Dr.-Ing. Wolfgang Kresse für die Betreuung meiner Masterarbeit herzlich bedanken.

Als Zweitgutachter gilt der Dank Prof. Dr.-Ing. Hans Jürgen Larisch.

Ein spezieller Dank geht an meine Familie und meinen Partner Tomasz, die mich immer tatkräftig unterstützt haben.

Kurzfassung

Im Rahmen dieser Masterarbeit wurde ein Softwareprodukt für die Umsetzbarkeit der Norm ISO/TS 19159-1 in Anwendung entworfen und implementiert. Zuerst werden grundlegende Informationen bezüglich des Themas beschrieben. In der Entwicklungsphase werden die einzelnen Vorbereitungsschritte durchgeführt. Zu denen gehören vor allem die inhaltliche Analyse der Norm ISO/TS 19159-1, die Beschreibung der verwendeten Softwareprogramme und die Analyse der Schema-Datei. Auf der Basis von XML Schema wird die XML-Datei erstellt. In der nächsten Bearbeitungsphase wird die inhaltliche Analyse eines in der Praxis verwendeten Kalibrierprotokolls durchgeführt. Die Entwicklungsphase wird mit dem Softwareproduktentwurf abgeschlossen, der im weiteren Verlauf der Arbeit implementiert wird. Abschließend wird die Testnutzung des Softwareprodukts durchgeführt.

Abstract

Within this master's thesis the software product, which puts into effect ISO/TS 19159-1 standard was projected and implemented. First of all, basics information related to the topic will be described. At the development stage particular preparation steps will be conducted. To these belongs especially text of the standard ISO/TS 19159-1 analysis, description of used software and analysis of Schema file. On the basis of XML Schema, XML file will be generated. In the next stage of the study, the examination of content of practically used calibration report will be conducted. Development stage will be finished by conception of software, which will be implemented in the further stage of the study. Finally, test application of software will be carried out.

Inhaltsverzeichnis

1. Einleitung 7
2. Grundlagen 9
2.1 Normen 9
2.2 ISO 9
2.2.1 ISO-Struktur 10
2.2.2 ISO-Normungsverfahren 11
2.3 Die Normenreihe ISO 191xx 12
3. Planung und Entwicklung 14
3.1 Inhaltliche Analyse der ISO/TS 19159-1 14
3.1.1 Die ISO-Norm als UML-Klassendiagramme 17
3.1.2 Bezugnahme auf andere Texte 19
3.2 Verwendete Software 19
3.3 XML Schema 20
3.3.1 Wohlgeformtheit der XML Schema 23
3.4 XML- Datei 23
3.4.1 Erarbeitung von XML-Datei 24
3.4.2 Validierung der XML-Datei gemäß dem XML Schema 27
3.5 Inhaltliche Analyse eines Kalibrierprotokolls 27
3.6 Beschreibung der aufgetretenen Schwierigkeiten 28
3.7 Softwareproduktentwurf 36
4. Implementierung 39
4.1 Softwareprodukt 39
4.1. Benutzeroberfläche 49

4.1.1 Layout des Hauptmenüs 49
4.1.2 Hinzufügen der Daten 50
4.1.3 Herstellung des Rapports 52
4.2 Testnutzung 53
5. Zusammenfassung 55
Abkürzungsverzeichnis 58
Literaturverzeichnis 59
Abbildungsverzeichnis 62
Tabellenverzeichnis 64
Anhang A 64
Anhang B 64
Anhang C 64
Anhang D 64
Anhang E 65

1. Einleitung

Für die richtige, effektive und allgemeine Anwendung der Daten ist es von großer Bedeutung, dass die Daten in Form, Charakter, Umfang und übermittelnden Inhalt übereinstimmend sind. Sogar die Daten, die möglichst genau den beschriebenen Bestand charakterisieren, können keine Vergleichsgrundlage und damit auch keine objektive Bewertungsbasis sein, wenn sie gemäß den verschiedenen Regeln erzeugt und benutzt werden. Zu dem Zweck der Vereinheitlichung dieser Prinzipien wurden die allgemein akzeptierten Normen eingeführt. Diese Normen sind die Grundlage für den problemlosen Austausch der Informationen zwischen den Systemen.

Mit den Normen beschäftigen sich viele verschiedene Stellen wie Normungsgremien, verschiedene Branchenverbände, Non-Profit-Organisationen und sogar Online-Communities. Einer der Führer bei der Entwicklung von den Normen für Geoinformatik ist International Organisation for Standardization (ISO). Die Normen der ISO stellen in diesem Bereich eine Weise der Zusammenfassung des aktuellen Wissens auf diesem Gebiet der Geoinformatik dar. Sie bilden eine Art des Strukturgerüsts, um die langfristige Gültigkeit und die Allgemeingültigkeit zu sichern. Die abstrakt angelegten ISO-Normen können als Grundlage für die weiteren Arbeiten dienen.

Die Motivation dieser Arbeit liegt in dem Wunsch, eine praktische Anwendbarkeit der ISO-Norm in Form von einem Softwareprogramm zu ermöglichen. Das Softwareprodukt wird die Werteneingabe für die Parameter und die Erstellung des Kalibrierprotokolls gewährleisten. Die Erarbeitungsbasis des Softwareprodukts ist die ISO/TS 19159-1, die sich auf die Kalibrierung von optischen Sensoren bezieht. Bei der Bearbeitung des Softwareprogramms wird Wert darauf gelegt, dass die angebotene Lösung der Aufgabenstellung bei der Umsetzung der anderen Normen verwenden werden könnte.

Im Rahmen dieser Masterarbeit werden zuerst die grundlegenden Informationen bezüglich des Themas beschrieben. In der Entwicklungsphase werden Vorarbeiten wie die Analyse der ISO-Norm durchgeführt. Der Inhalt der Norm wurde in die UML-Klassendiagramme angelegt, aus denen ein XML Schema mit Hilfe von

ShapeChange (außerhalb des Rahmens dieser Masterarbeit) abgeleitet wird. Anschließend wird ein Ausschnitt aus dem XML Schema beschrieben. Auf der Basis von dem XML Schema wird eine XML-Datei mittels der fachkundigen Software erstellt. Ihre Erarbeitungsweise wird im weiteren Verlauf der Arbeit dokumentiert. Die Entwicklungsphase verlangt auch die Analyse des in der Praxis verwendeten Kalibrierprotokolls, die Beschreibung der auftretenden Schwierigkeiten und die Ausarbeitung des Softwareprogrammentwurfs. Im Folgenden wird der erstellte Quellcode des Softwareprogramms schrittweise erläutert, die Benutzeroberfläche dargestellt und die Testnutzung des Softwareprodukts durchgeführt. Zum Abschluss dieser Masterarbeit wird eine Zusammenfassung gegeben.

2. Grundlagen

In diesem Kapitel werden grundlegende Informationen beschrieben, die dem besseren Überblick über die Arbeit dienen. Zuerst wird der Begriff „Norm“ erläutert. Weiterhin werden die Normungsorganisation und ihre Struktur präsentiert. Das folgende Unterkapitel beschäftigt sich mit dem ISO-Normungsverfahren. Abschließend werden die einzelnen Normen kurz inhaltlich beschrieben, um eine Übersicht über die Normreihe ISO 191xx zu bekommen.

2.1 Normen

Nach DIN EN 45020 ist eine Norm „ein Dokument, das mit Konsens erstellt und von einer anerkannten Institution angenommen wurde und das für die allgemeine und wiederkehrende Anwendung Regeln, Leitlinien oder Merkmale für Tätigkeiten oder deren Ergebnisse festlegt, wobei ein optimaler Ordnungsgrad in einem gegebenen Zusammenhang angestrebt wird.“ [IQ1]

Die Normungserarbeitung läuft nach den Grundsätzen der Freiwilligkeit, Öffentlichkeit, Wirtschaftlichkeit wie auch Sachbezogenheit ab. Die wesentlichen Prinzipien bei diesem Prozess sind auch Einheitlichkeit, Widerspruchsfreiheit sowie Beteiligung aller interessierten Kreise. [1, F. 14]

Die internationalen Normen werden von der Internationale Organisation für Normung (ISO) erarbeitet. [1, F. 13] Auf nationaler Ebene ist das Deutsche Institut für Normung (DIN) für den Normungsprozess verantwortlich. [1, F. 15]

2.2 ISO

Das Wort „ISO“ ist vom griechischen Wort „isos“ abgeleitet und bedeutet so viel wie „gleich“. Die ISO (International Organisation for Standardization) ist ein internationaler Verband von Normungsorganisationen, der die Normen in allen Bereichen mit Ausnahmen der Telekommunikation, Elektrotechnik und Elektronik erarbeitet. Für den Bereich Telekommunikation ist die Internationale Fernmeldeunion (ITU) und für das Fachgebiet Elektrotechnik und Elektronik hingegen die Internationale Elektrotechnische Kommission (IEC) zuständig. Diese drei erwähnten Institutionen bilden die WSC (World Standards Cooperation).

Die Gründung der ISO, die die ISA (International Federation of National Standardizing Associations) und den Normenkoordinierungsausschuss der

Vereinigten Nationen (UNSCC) ersetzte, erfolgte im Jahr 1946. [IQ2] Derzeit (Stand: September 2015) zählt die Organisation 162 Mitgliedsländer. Hiervon sind 119 Vollmitglieder, 38 korrespondierende Mitglieder und 5 haben Beobachtungsstatus. [IQ3] Die ISO-Normen werden in drei Sprachen, nämlich Englisch, Französisch und Russisch veröffentlicht. Für weitere Übersetzungen sind die nationalen Normungsinstitutionen zuständig. [IQ2]

Die Arbeit von ISO basiert auf drei Prinzipien: Konsens, weltweite Gültigkeit und Freiwilligkeit. Die erste Regel verlangt die Berücksichtigung der Sicht aller Beteiligten. Der zweite Grundsatz führt zur Entstehung von Normen, die globale Bedürfnisse der Industrie und der Kunden absichern. Die letzte Regel definiert die ISO-Aktivität als freiwilliges Engagement aller Interessengruppen. [2, S. 10]

2.2.1 ISO-Struktur

Die Arbeit der ISO ist dezentralisiert. Während das Hauptsekretariat der ISO sich hauptsächlich mit der Entwicklung von den nach ISO-Vorschriften einheitlichen Normen beschäftigt, findet die eigentliche Arbeit in den Technischen Komitees (TC) und Subkomitees (SC) statt. Jedes Technische Komitee und Subkomitees hat ein eigenes Sekretariat bei einer sachverständigen Institution irgendwo auf der Welt. [2, S. 11] In Abhängigkeit vom Umfang des Themas wird ein Technisches Komitees in Subkomitees oder Arbeitsgruppen (WGs) unterteilt, die für die Entwicklung einer Norm oder eines ähnlichen Arbeitsergebnisses zuständig sind. Bei Bedarf entstehen zwei oder mehr Projektteams (PT).

2.2.1.1 TC 211

Das TC 211 ist das Technische Komitee Nr. 211 der internationalen Normungsorganisation, das sich mit der Normung im Bereich der digitalen geografischen Informationen beschäftigt. Die Mitglieder dieses Komitees befassen sich mit der Normenreihe ISO 191xx. Ihre Arbeit zielt auf einen strukturierten Normensatz ab, der Methoden, Werkzeuge, Dienstleistungen für Verwaltung der geografischen Informationen bestimmt. Dieses Management betrifft die Definition, den Erwerb, die Verarbeitung, die Analyse, den Zugriff, die Darstellung und die Übertragung solcher Daten zwischen verschiedenen Benutzern, Systemen und

Standorten. Die Gesamtzahl der veröffentlichten ISO-Normen, die von dem TC 211 erarbeitet wurden, ist aktuell etwa 70 (Stand: September 2015).

Die Struktur des Technische Komitee Nr. 211 und das Arbeitsfeld der entsprechenden Subkomitees oder Working Groups wird im Folgenden (siehe Tabelle 1) vorgestellt. [IQ4]

Subkomitees/Working Groups	Arbeitsfeld
ISO/TC 211/WG 1	Framework und Referenzmodell
ISO/TC 211/AHG 1	Kontrollstelle für die ISO-Registrierung geodätisches Netz
ISO/TC 211/AHG 2	Best Practice für die UML-Modellierung
ISO/TC 211/AHG 3	Programmwartungsgruppe (PMG)
ISO/TC 211/WG 4	Geospatial Services
ISO/TC 211/AHG 4	Strategie und Unternehmensplan
ISO/TC 211/ WG 6	Bilddaten
ISO/TC 211/ WG 7	Information communities
ISO/TC 211/ WG 9	Informationsmanagement
ISO/TC 211/ WG 10	allgemeiner Zugang der Öffentlichkeit

Tabelle 1 Arbeitsfelder der Working Groups und ad-hoc Groups, Quelle: [IQ4]

2.2.2 ISO-Normungsverfahren

Die Idee für eine neue Norm wird immer außerhalb der ISO geboren, somit beruht die Rolle von der ISO darauf, diese Konzeption zu einer internationalen Norm zu führen. Die Normentwicklung erfolgt in sechs unten beschriebenen Schritten: [2, S. 12]

1) Vorschlag für eine Norm (Proposal stage). Bei Bedarf einer Branche an eine neue Norm wird durch die Vermittlung der nationalen Normungsorganisation eine New Work Item Proposal (NWIP) an ISO gesendet. Das Hauptsekretariat leitet die NWIP zur Abstimmung an das entsprechende Technische Komitee oder Subkomitee weiter.
2) Vorbereitung der Norm (Preparatory stage). Das TC oder SC bestimmt die Arbeitsgruppe und ihren Vorsitzenden. Die Arbeitsgruppe bereitet einen

Arbeitsentwurf (WD) als erste schriftliche Zusammenfassung der kommenden Norm vor.

3) Bearbeitung der Norm (Committee stage). Nach der Entstehung des Normentwurfs wird das Dokument von dem ISO-Hauptsekretariat registriert und allen Mitglieder des Technischen Komitees oder Subkomitees zur Stellungnahme vorgelegt. In dieser Phase wird das Dokument von unabhängigen Experten überprüft.
4) Untersuchungsphase (Enquiry stage). Das Dokument – Draft International Standard (DIS) wird über einen Zeitraum von fünf Monaten tiefgründig analysiert. Schließlich wird ein Final Draft International Standard (FDIS) formuliert.
5) Genehmigung der Norm (Approval stage). In dieser Phase entscheiden die ISO-Mitglieder über Bewilligung von FDIS. [2, S. 13]
6) Veröffentlichung der Norm (Publication stage). Nach der Bewilligung von FDIS werden geringfügige redaktionelle Änderungen im endgültigen Normtext eingefügt. Der internationale Standard wird vom ISO-Hauptsekretariat veröffentlicht. [2, S. 14]

2.3 Die Normenreihe ISO 191xx

Im Rahmen der zwanzigjährigen Aktivität des TC 211 wurde eine Normenreihe im Nummernbereich von ISO 19101 bis ISO 19163 erstellt und in der überwiegenden Mehrzahl herausgegeben. [IQ5, S. 1]

Die ISO 19101 umfasst das Referenzmodell für den Bereich der geografischen Informationen. Die Regeln und Richtlinien für die Verwendung einer konzeptionellen Schemasprache im Rahmen der ISO-Normen des TC 211 sind in ISO/TS 19103 enthalten. Als die grafische Modellierungssprache wurde die Unified Modeling Language (UML) gewählt. ISO 19104 betrifft die Erfassung und Aufbewahrung der Fachbegriffe. [IQ6] Die nächste Norm (ISO 19105) legt das Verfahren im Bereich Geoinformatik fest, dass die normgerechte Entwicklung eines Produkts (Softwareprogramm) kontrolliert. In den beiden Normen ISO 19106 und ISO 19109 wurde der Ablauf zur Verwendung eines Teils einer Norm (Profil) und der Ergänzung um weitere Funktionalitäten (Application Schema)

definiert. Die geodätischen Grundlagen im Bereich Geoinformatik wurden in der ISO 19111 beschrieben. [IQ5, S. 3] Die ISO-Norm unter dem Titel „Procedures for item registration“ beinhaltet die Prozeduren, nach den ein Register erstellt und erhalten wird. Die ISO 19157 definiert alle relevanten Komponenten zur Beschreibung der Datenqualität. [IQ6]

Die ISO 19101-2 enthält die Zusammenstellung aller Teilgebiete Photogrammetrie und Fernerkundung. Die Metadaten für diese Fachbereiche wurden in der ISO 19115 beschrieben. Die Georeferenzierung von Daten wird in der ISO/TS 19130 erläutert. Die Norm ISO 19139-2 regelt das XML Schema für die Imagery-Metadaten. [IQ5, S. 2] Die ISO/TS 19159 beinhaltet die Kalibrierung der Bildsensoren von der Fernerkundung und die Validierung der Kalibrierungsinformationen.

3. Planung und Entwicklung

Zu Beginn der Bearbeitung einer Thesis ist es wichtig, sich mit der Komplexität des Themas auseinanderzusetzen, um die Zwischenziele zu bestimmen und diese zeitlich abzustecken. Im Folgenden werden die Meilensteine vorgestellt, die für das Projekt gesetzt wurden.

Meilensteine	Zeitraum der Bearbeitung
1. Inhaltliche Analyse der ISO/TS 19159-1	4 Wochen
2. Inhaltliche Analyse und Validierung des XML Schemas	5 Wochen
3. Erarbeitung einer XML-Datei	
4. Validierung der XML-Datei gegen XML-Schema	
5. Inhaltliche Analyse eines Kalibrierprotokolls	1 Woche
6. Erarbeitung des Softwareprodukts	11 Wochen
7. Durchführung des Tests	2 Wochen

Tabelle 2 Meilensteine der Masterarbeit, Quelle: eigene Bearbeitung

Die Bearbeitung der Masterarbeit wurde in sieben Phasen gegliedert. Als Erstes wird ein Überblick über den Inhalt der ISO-Norm erlangt. In der zweiten Phase wird die Schema-Datei analysiert und auf Korrektheit geprüft. Dann wird die XML-Datei auf der Basis von der XML Schema erarbeitet. In der nächsten Bearbeitungsphase wird die inhaltliche Analyse eines in der Praxis verwendeten Kalibrierprotokolls durchgeführt. Dann wird ein Softwareprodukt mit der graphischen Benutzeroberfläche erarbeitet. Schließlich wird das Softwareprogramm an einem typischen Beispiel getestet. Die Fortschritte und Erkenntnisse werden während der gesamten Zeit dokumentiert.

3.1 Inhaltliche Analyse der ISO/TS 19159-1

Bevor die unmittelbare Umsetzbarkeit der Norm in Anwendung durchgeführt werden kann, ist es notwendig, zumindest einen groben Überblick über den Inhalt der ISO-Norm 19159-1 zu erlangen.

Die ISO/TS 19159-Serie wurde in mehreren Teilen aufgeteilt, von denen jede einen bestimmten Sensortyp betrifft (siehe Abbildung 1). [3, S. 11] Die ISO/TS 19159-1 und ISO/TS 19159-2 beziehen sich auf die Kalibrierung von optischen Sensoren und Lidar-Sensoren. Die folgenden Teile der ISO/TS 19159 wurden geplant, um sowohl die Kalibrierung von RADAR samt SAR und InSAR, als auch SONAR zu definieren. [3, S. 5]

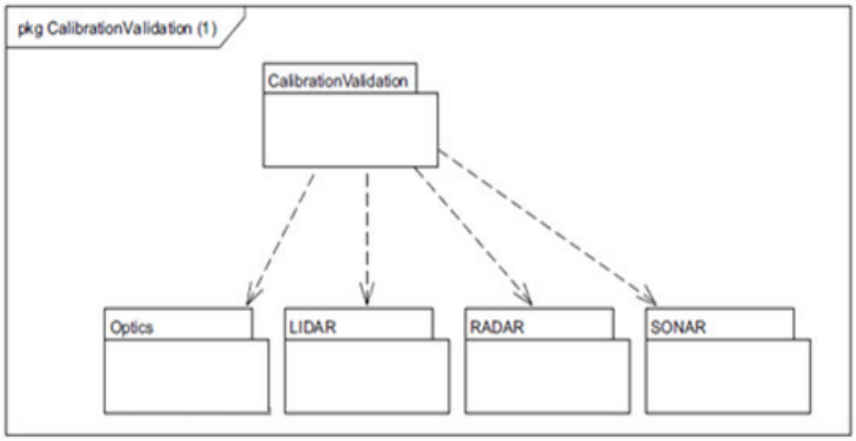


Abbildung 1 Schema der ISO/TS 19159, Quelle: [3, S. 12]

Der Hauptinhalt der Norm ISO/TS 19159-1 wurde in vier Komponenten aufgeteilt (siehe Abbildung 2).

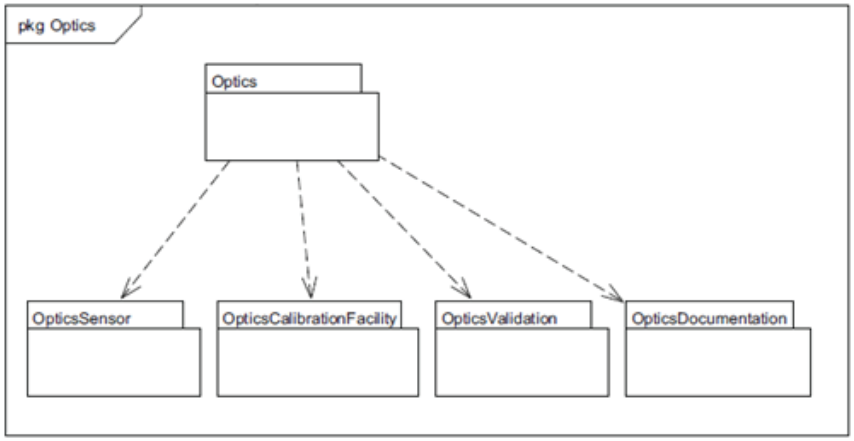


Abbildung 2 Schema der ISO/TS 19159-1, Quelle: [3, S. 12]

Der Bestandteil *OpticsSensor* beschreibt die optischen Sensoren zur luft- oder raumgestützten Photogrammetrie. Dazu gehören die Digitalkameras mit einem Vollformatsensor, Zeilenkameras sowie die Sensoren, die in der Lage sind, elektromagnetische Strahlung im Infrarotspektrum aufzunehmen, wie thermische, multispektrale und hyperspektrale Kameras. Alle Messungen dieses Teils der

ISO/TS 19159, die mit der Positionierungsgenauigkeit verbunden sind, führen zu den quantitativen Ergebnissen nach ISO 19157 und ISO 19115-1. [3, S. 11]

Im Element *OpticsSensor* wurden die Einzelheiten der Geometrie des Sensorsystems definiert, die relevant für eine geometrische Kalibrierung des Systems sind. Die Werte von diesen Parametern kommen aus dem globalen Navigationssatellitensystem (GNSS) und dem inertialen Navigationssystem (IMU). [3, S. 17] Die ISO/TS 19159-1 beinhaltet auch die Informationen über die radiometrische Kalibrierung. [3, S. 26]

Der Bestandteil *OpticsCalibrationFacility* der ISO/TS 19159 beschreibt die Kalibriereinrichtung (Labor oder in-situ). Dieses Element liefert detaillierte Informationen über die Ausstattung der Testfelder, die Kalibrierung der Luftbilder und die Bündelblockausgleichung. Hier wurden die Kalibriergeräte, Eigenschaften des Sensorsystems und Umweltbedingungen angesprochen. [3, S. 36]

In dem Element *OpticsValidation* wurden alle Informationen im Zusammenhang mit Validierung der geometrischen und radiometrischen Kalibrierung eines Fernerkundungssensors zusammengefasst. [3, S. 46]

OpticsDocumentation enthält die Parameter, die für die Dokumentation der Kalibrierungsergebnisse bedeutsam sind. [3, S. 36] In diesem Abschnitt wurden als Beispiel Produkt-Levels vorgeschlagen (siehe Tabelle 3). Die in der Norm präsentierten Produkts-Levels haben keine normative Bedeutung.

Level	Beschreibung
Rohdaten	Unverarbeitete Originaldaten
Level0	Rekonstruierte nicht verarbeitete Daten bei voller Raum-Zeit-Auflösung mit Zusatzinformationen
Level1	Rekonstruierte nicht verarbeitete Daten bei voller Auflösung, zeitbezogene und mit Zusatzinformationen
Level2	Abgeleitete geophysikalische Parameter mit der gleichen Auflösung und Lage wie die Daten von Level1
Level3	Daten oder abgerufen geophysikalischer Parameter, räumlich und/oder zeitlich neu abgetastet

Level4	Modellausgang oder Ergebnisse aus der Analyse der unteren Datenebenen
andere	

Tabelle 3 Beispiel von Produkt-Levels, Quelle: eigene Bearbeitung auf Basis von [3, S.49]

In der Form eines Anhangs wird eine detaillierte Beschreibung der einzelnen Klassen und ihrer Attributen [3, S. 55] platziert. In Abbildung 3 wird ein Ausschnitt von dieser Tabelle präsentiert.

	Name/role name	Definition	Obligation/ condition	Max. occurrence	Data type/ class	Domain
1.	CA_CalibrationValidation 6.1.2	root entity that defines information about calibration	Use obligation/ condition from referencing object	Use maximum occurrence from referencing object	Aggregated Class (MD_Coverage Description)	
2.	calibrationType	characterization of the calibration coded with the data type CA_Calibration-Type	M	1	CA_Calibration Type	
3.	CA_PhotoFlight 6.1.3	information about the photo flight that was performed to derive the calibration results from	Use obligation/ condition from referencing object	Use maximum occurrence from referencing object	Aggregated Class (CA_Calibration Validation)	
4.	numberOfPhotoFlights	quantity of photo flights that are taken for performing the calibration	M	1	Integer	
5.	photoScale	average photo scale of the calibration project	M	N	Real	0.0 – 1.0
6.	flyingHeight	average height of the sensor platform above the reference height plane	M	N	Length	
7.	flyingAltitudeAboveGround	average height of the sensor platform above the ground	M	N	Length	
8.	terrainHeight	average height of the terrain where the calibration is performed NOTE The terrain height is modelled as one value because it is an aggregate value which is often for information purposes or as an approximate value.	M	1	Length	

Abbildung 3 Tabellarische Beschreibung der einzelnen Klassen und Attributen, Quelle: [3, S. 55]

Weiterhin werden unter anderem die Details der photogrammetrischen Verzeichnungsmodelle [3, S. 87] und die Qualitätsmaßnahmen von der Kalibrierung und Validierung [3, S. 96] platziert.

3.1.1 Die ISO-Norm als UML-Klassendiagramme

Der Inhalt der ISO-Norm ist im Wesentlichen mit Hilfe von der Modellierungssprache UML in Form von den Klassendiagrammen beschrieben.

Ein Klassendiagramm stellt die Objekttypen im System und die verschiedenen Arten von Beziehungen zwischen ihnen dar. Im Übrigen zeigen Klassendiagramme die Strukturmerkmale und Operationen einer Klasse. [4, S. 55]

Der Inhalt der ISO-Norm wurde in ausführliche Klassendiagramme eingeteilt, aber der Kern des Datenmodells nach der ISO/TS 19159-1 ist die Klasse *CA_OpticalSensors* für die Kalibrierung von Fernerkundungssensoren. In Abbildung 4 ist diese Klasse als UML-Klassendiagramm dargestellt.

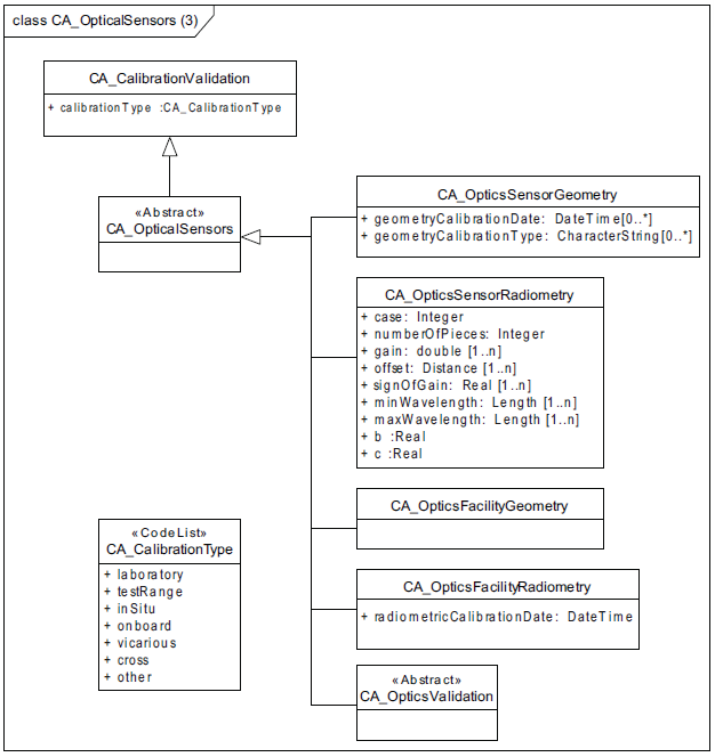


Abbildung 4 *CA_OpticalSensors* als UML-Klassendiagramm, Quelle: [3, S. 16]

Die abgebildete Klassenhierarchie zeigt die Oberklasse *CA_CalibrationValidation.* Diese Klasse beschreibt die Informationen über den Kalibrierungsprozess und hat ein Attribut *CalibrationType*, das Kalibrierungsarten definiert: laboratory, testRange, InSitu, onboard, vicarious, cross, other. Diese Eigenschaftswerte wurden in der Codeliste *CA_CalibrationType* beigefügt und im Anhang B.9 der Norm näher erläutert.

Die CA_OpticalSensors ist eine Unterklasse von der Klasse *CA_CalibrationValidation* und somit vererbt die *CA_OpticalSensors* ihre Eigenschaften. Von dieser abstrakten Klasse werden niemals Objekte erzeugt. Aber sie ist Basis für weitere fünf Unterklassen: *CA_OpticsSensorGeometry, CA_OpticsSensorRadiometry,*

CA_OpticsFacilityGeometry, CA_OpticsFacilityRadiometry, CA_OpticsValidation, die ausführlich in den anderen Klassendiagrammen der Norm beschrieben wurden.

3.1.2 Bezugnahme auf andere Texte

Die ISO/TS-Norm 19159-1 enthält die normativen Referenzen auf die Normenreihe der ISO 191xx. Die expliziten Verweise sind für das Verständnis der ISO/TS-Norm 19159-1 erforderlich. Zu diesen gehören die folgenden Normen:

- ISO 19115-2, *Geographic information — Metadata — Part 2: Extensions for imagery and gridded data*
- ISO 19130, *Geographic information — Imagery sensor models for geopositioning*

Eine weitere Beziehung zwischen den Normen bezeichnet man als eine implizite Referenz. Die ISO/TS 19159-1 besitzt die folgenden impliziten Verweise:

- ISO 19107, *Geographic information — Spatial Schema*
- ISO 19115-1, *Geographic information — Metadata — Part 1: Fundamentals*
- ISO 19139, *Geographic information — XML Schema Implementation*
- ISO 19157, *Geographic information — Data quality*

3.2 Verwendete Software

Bei der Bearbeitung der weiteren Arbeitsabschnitte werden die fachkundigen Softwareprogramme erforderlich sein.

Altova XMLSpy

Dies ist ein XML-Editor, der eine integrierte Entwicklungsumgebung von Altova ist. *XMLSpy* kann unter anderem für die Erarbeitung, Editierung und Debuggen aller XML-Technologien benutzt werden. Das Programm bietet z.B. die Text-Ansicht (Abbildung 8) oder die grafische XML Schema-Ansicht mit vielen zusätzlichen Funktionen an. *XMLSpy* ermöglicht die Prüfung der Wohlgeformtheit von der XML-Datei. Die XML-Datei kann auch auf Korrektheit in Bezug auf das XML-Schema validiert werden. Zur Verfügung stellt Altova eine kostenlose 30-Tage-Testversion von *XMLSpy* als ein Softwareprogramm der gesamten Produktlinie. [IQ7]

Abbildung 5 Das Altova XMLSpy-Logo, Quelle: [IQ7]

Java SE Development Kit 8 (Update 45)

Das ist eine frei verfügbare Entwicklungsumgebung von der Firma Oracle für die Erstellung von Applikationen und Komponenten mit Hilfe von der Programmiersprache Java. Das enthält die Werkzeuge für die Entwicklung und Testen der in Java geschriebenen Programme. [IQ8] *Java SE Development Kit 8* ist unter dem Link http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html zu erreichen.

Abbildung 6 Das Java- Logo, Quelle: [IQ8]

Eclipse IDE for Eclipse Committers 4.4.2

Eclipse ist eine frei erhältliche integrierte Entwicklungsumgebung (IDE), die auf der Seite https://eclipse.org/downloads/packages/eclipse-ide-eclipse-committers-442/lunasr2 zu erreichen ist. Eclipse bietet unter einer gemeinsamen Programmoberfläche eine Vielfalt von Werkzeugen für die Programmentwicklung an. [10, S. 129] Mit Hilfe von den zahlreichen verfügbaren Plug-ins kann Eclipse an verschiedenste Anforderungen angepasst werden. Eclipse unterstützt nahezu jede Programmiersprache auch Java. [10, S. 130]

Abbildung 7 Das Eclipse-Logo, Quelle: [IQ9]

3.3 XML Schema

Als ein Schema wird eine formelle Beschreibung eines verbindlichen Dokuments bezeichnet. Ein XML Schema ist eine vorschriftsmäßige Darstellung einer gültigen XML-Datei. Dabei werden die XML Schemata in Form von XML-Dokumenten konstruiert.

Eine Empfehlung für das XML Schema wurde im Jahr 2002 vom W3C (World Wide

Web Consortium) veröffentlicht, das [11, S. 269] seit 1994 an der Erstellung von Standards für Webtechniken arbeitet. [12, S. 439]

Aus den UML-Klassendiagrammen, die in der ISO/TS-Norm 19159-1 enthalten sind, wurde ein XML Schema mit Hilfe von *ShapeChange* (außerhalb des Rahmens dieser Masterarbeit) abgeleitet. *ShapeChange* ist ein Java-basiertes Werkzeug, das aus einem UML-Modell ein nach der ISO-Norm 19109 aufgebaute Zieldarstellung erzeugt. Die am häufigsten genutzte Zieldarstellung ist ein XML Schema. [IQ10]

Um ein gültiges im Sinne des XML Schemas XML-Dokument (Instanz-Dokument) zu erstellen, ist es wichtig, ein vertieftes Verständnis über die Struktur des XML Schemas zu erlangen.

In Abbildung 8 ist ein Ausschnitt aus dem XML Schema für die ISO/TS-Norm 19159 dargestellt. Die erste Linie in einem XML Schema wird als Prolog bezeichnet. Der Prolog ist optional und enthält die Informationen über die XML-Versionsnummer und die Kodierung, die in dem Dokument verwendet wird. [IQ11] Das Schema-Dokument hat das Wurzelelement <schema>, das mit einigen Attributen ausgestattet wird. Ersteres stellt dar, dass die Elemente und die Datentypen, die im Schema verwendet werden, zum Namensraum[1] vom XML Schema gehören. Die weiteren Attribute weisen die Zuordnung zu den anderen möglichen Namensräumen. Diese Deklaration *elementFormDefault="qualified"* zeigt, dass alle Elemente der XML-Instanz-Dokument für die Namensräume qualifiziert werden müssen. Die Import-Elemente werden verwendet, um mehrere Schemata mit den verschiedenen Namensräumen zu einem Dokument zusammenzufügen. [IQ12]

[1] Namensräume ermöglichen es, gleichlautende Elemente und Attribute mit unterschiedlichen Bedeutungen in verschiedenen Vokabularen eindeutig voneinander zu unterscheiden. [12, S. 63]

```
1  <?xml version="1.0" encoding="UTF-8"?>
2  <schema xmlns="http://www.w3.org/2001/XMLSchema" xmlns:ex="http://example.com/ISO19159-1" xmlns:gmd="
   http://www.isotc211.org/2005/gmd" xmlns:gml="http://www.opengis.net/gml/3.2" targetNamespace="
   http://example.com/ISO19159-1" elementFormDefault="qualified">
3    <import namespace="http://www.isotc211.org/2005/gmd" schemaLocation="
   http://schemas.opengis.net/iso/19139/20070417/gmd/gmd.xsd"/>
4    <import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>
5    <!--XML Schema document created by ShapeChange - http://shapechange.net/-->
6    <element name="CA_2DReflectanceTarget" type="ex:CA_2DReflectanceTargetType" substitutionGroup="
   ex:CA_RadiometryTestRange"/>
7    <complexType name="CA_2DReflectanceTargetType">
8      <complexContent>
9        <extension base="ex:CA_RadiometryTestRangeType">
10         <sequence>
11           <element name="linearSize" type="gml:LengthType"/>
12           <element name="targetExpanse" type="gml:AreaType"/>
13           <element name="shape" type="ex:CA_RadiometricTargetShapeType"/>
14           <element name="material" type="ex:CA_RadiometricTargetMaterialType"/>
15           <element name="spectralCharacteristics" type="ex:CA_SpectrumPropertyType"/>
16           <element name="measuredReflectance" type="ex:CA_MeasuredReflectancePropertyType"/>
17           <element name="minimumNominalReflectance" type="double"/>
18           <element name="maximumNominalReflectance" type="double"/>
19           <element name="radiometricStability" type="string"/>
20           <element name="cleanness" type="string"/>
21           <element name="absoluteAccuracy" type="double"/>
22         </sequence>
23       </extension>
24     </complexContent>
25   </complexType>
26   <complexType name="CA_2DReflectanceTargetPropertyType">
27     <sequence minOccurs="0">
28       <element ref="ex:CA_2DReflectanceTarget"/>
29     </sequence>
30     <attributeGroup ref="gml:AssociationAttributeGroup"/>
31     <attributeGroup ref="gml:OwnershipAttributeGroup"/>
32   </complexType>
```

Abbildung 8 Ein Ausschnitt aus dem XML Schema für die ISO/TS-Norm 19159, Quelle: [13]

Innerhalb des Schemas sind viele oberste Elemente (Wurzelelemente) vertreten. [12, S. 113] Zu diesem obersten Element wird zunächst ein Name (*CA_2DReflectanceTarget*), ein Attribut *substitionGroup* (Ersetzungsgruppe) und ein Datentyp angegeben. Als eine Ersetzungsgruppe bezeichnet man eine Gruppe von Elementen, die in einem Instanz-Dokument ein bestimmtes Element austauschen können. [11, S. 298] Die Elemente der Ersetzungsgruppe *CA_RadiometryTestRange* wurden in der Fortsetzung des Schemas deklariert. Der Datentyp *CA_2DReflectanceTargetType* ist eine Erweiterung von einem komplexen Elementtyp *CA_RadiometryTestRangeType*, dessen Elemente in der Fortsetzung des Schemas dargestellt wurden. *CA_RadiometryTestRangeType* besteht aus 10 folgenden Elementen: *calibrationType, radiomerticCalibrationDate, lampType, atmosphericCondition, aerosolQuantity, numerPoints, expanse, minimumElevation, maximumElevation, averageElevation.* Die in der Sequenz angegebenen Elemente werden in dem Instanz-Dokument nach den Elementen des Basistyps angefügt. [12, S. 153-S.154] Diese Sequenz besteht aus 11 Elementen. Für jedes Element wurde einen Datentyp definiert. Einige Elemente wurden als einfache Datentypen wie *string* oder *double* beschrieben. Alle anderen Parameter

wurden als komplexe Datentypen deklariert. Die Mehrheit von denen ist in der Fortsetzung des Schemas zu finden. Die übrigen Datentypen wie *gml:LengthType* und *gml:AreaType* werden außerhalb der Norm 19159-1 bestimmt. Solche Datentypen sind im Internet unter der URL http://www.datypic.com/sc/niem21/ss.html festzulegen.
Das XML Schema besteht aus über 2150 Zeilen und schließt in sich weitere zahlreiche Wurzelelemente ein (über 90). Deshalb wurde nur ein Ausschnitt vom Schema schriftlich analysiert.

3.3.1 Wohlgeformtheit der XML Schema

Um eine Datei als XML-Dokument zu bezeichnen, muss diese die syntaktischen Regeln der XML-Spezifikation erfüllen. [12, S. 439] Die Grammatik von XML ist in 81 Produktionsregeln enthalten. [12, S. 45] Unten werden beispielhaft Prinzipien beschrieben. Das XML-Dokument muss ein Element auf der obersten Ebene beinhalten. Unterhalb dieses Wurzelelements müssen alle weiteren Elemente korrekt eingeschlossen sein. Alle Elemente müssen ein Start-Tag und dazu ein passendes End-Tag besitzen. [12, S. 439] Einzig wohlgeformte Dateien können als XML erkannt und von den verschiedenen Werkzeugen erfolgreich verwendet werden. [14, S. 29]
Zur Prüfung der Wohlgeformtheit wurde Altova XMLSpy verwendet. Es wurde die Menüoption *XML⟶ Wohlgeformtheit prüfen* gewählt. Das Ergebnis wurde im Meldungsfenster angezeigt (siehe Abbildung 9).

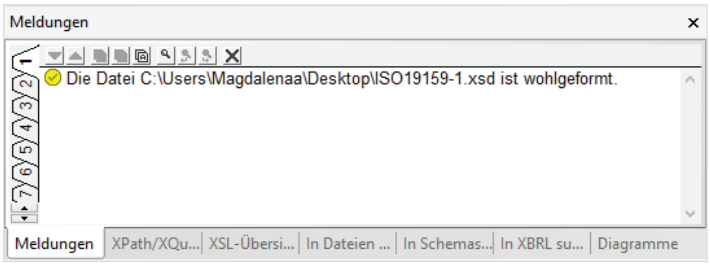


Abbildung 9 Ein Meldefenster bei der Wohlgeformtheitsprüfung, Quelle: eigene Bearbeitung

3.4 XML- Datei

Als XML, die Extensible Markup Language (auf Deutsch: erweiterbare Auszeichnungssprache), bezeichnet man ein Textformat, das die Strukturprinzipien für den Aufbau von Beschreibungsdaten, die zusätzliche

Informationen über die Bedeutung der Daten liefern, und Nutzdaten definiert. Dieses Format wird für diverse Anforderungen im Bereich der Datenspeicherung verwendet. Jedes wohlgeformte XML-Dokument muss die im Kapitel 4.3.1. erwähnte XML-Grammatik beachten. XML wurde von dem im Kapitel 4.3. genannten Standardisierungsgremium W3C entwickelt. [14, S. 27]

3.4.1 Erarbeitung von XML-Datei

Ein wesentlicher Bestandteil dieser Arbeit ist eine XML-Datei, die alle in der ISO/TS- Norm 19159-1 beschriebenen Parameter der Kalibrierung von optischen Sensoren einschließen wird. In Hinsicht auf die Weitläufigkeit der Norm wird nur ein Wurzelelement in der manuellen Erarbeitung der XML-Datei berücksichtigt. Die Erarbeitung der XML-Datei erfolgt mit Hilfe von Altova XMLSpy. In Abbildung 10 wird das XML-Dokument mit den Musterwerten dargestellt.

```
1  <?xml version="1.0" encoding="UTF-8"?>
2  <CA_2DReflectanceTarget xmlns="http://example.com/ISO19159-1"
3                          xmlns:gml="http://www.opengis.net/gml/3.2"
4                          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
5                          xsi:schemaLocation="http://example.com/ISO19159-1 ISO19159-1.xsd"
6                          gml:id="GML_7b1a5a6f-ddad-4c3d-a507-3eb9ee0a8e68">
7     <calibrationType>laboratory</calibrationType>
8     <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
9     <lampType>type of illumination used</lampType>
10    <atmosphericCondition>state of the atmosphere</atmosphericCondition>
11    <aerosolQuantity>0.0</aerosolQuantity>
12    <numberPoints>0</numberPoints>
13    <controlPoint>0.0</controlPoint>
14    <expanse uom="#m">0.0</expanse>
15    <minimumElevation uom="#m">0.0</minimumElevation>
16    <maximumElevation uom="#m">0.0</maximumElevation>
17    <averageElevation uom="#m">0.0</averageElevation>
18    <linearSize uom="#m">0.0</linearSize>
19    <targetExpanse uom="#m">0.0</targetExpanse>
20    <shape>square</shape>
21    <material>awning</material>
22    <spectralCharacteristics>
23       <CA_Spectrum>
24          <numberBands>0</numberBands>
25          <wavelength uom="#m">0.0</wavelength>
26          <response>0.0</response>
27       </CA_Spectrum>
28    </spectralCharacteristics>
29    <measuredReflectance>
30       <CA_MeasuredReflectance>
31          <intensity>0.0</intensity>
32          <wavelength uom="#m">0.0</wavelength>
33          <zenithAngle uom="#m">0.0</zenithAngle>
34          <azimuth uom="#m">0.0</azimuth>
35       </CA_MeasuredReflectance>
36    </measuredReflectance>
37    <minimumNominalReflectance>0.0</minimumNominalReflectance>
38    <maximumNominalReflectance>0.0</maximumNominalReflectance>
39    <radiometricStability>description of the radiometric stability of the target</radiometricStability>
40    <cleanness>description of the cleanness of the target</cleanness>
41    <absoluteAccuracy>0.0</absoluteAccuracy>
42 </CA_2DReflectanceTarget>
```

Abbildung 10 Das XML- Dokument mit dem Wurzelelement *CA_2DReflectanceTarget* und den Musterwerten, Quelle: eigene Bearbeitung

Die eingegebenen Default-Einstellungen hängten von dem in der Norm definierten Datentyp des Parameters ab. Für die Daten, die als Zeichenkette bezeichnet wurden, wurde die Beschreibung des Parameters aus dem Anhang B der ISO-Norm verwendet. Mit Ausnahme der Parameter, die den Musterwert aus der Liste der verfügbaren Werte annehmen müssen. In diesem Fall wurde der erste Wert aus der Liste dem Parameter zugeschrieben. Für *Double* und *Integer* wurde die Null hinzugefügt, die mit dem Datentyp übereinstimmend war. Die Anweisungen der ISO-Norm, die den Umfang des Wertes betreffen, wurden auch berücksichtigt. Dabei wurde die nächste zulässige Zahl dem Parameter zugeschrieben. Die Parameter, die die genaue Datum- und Uhrzeiteingabe verlangen, wurden mit den Wert 1-09-2015 12:00:00 versehen. Für die Bestimmung des Datums wurde nur der Wert 1-09-2015 verwendet. Den Zeiteingaben wurde die Syntax 0-0-0 0:00:00 zugeordnet. Für den Typ *Boolean* wurde die Default-Einstellungen *yes* definiert.

Wegen des Umfangs der XML Schema-Datei wurde nach einer automatischen Bearbeitungsmöglichkeit gesucht. Altova XMLSpy bietet solche Möglichkeit an, aber aufgrund der Vielzahl der Wurzelelemente war es nicht realisierbar, eine vollständige XML-Datei mit Hilfe von Altova XMLSpy auf einmal automatisch zu erzeugen. Das XML Schema wurde daher nach den Wurzelelementen aufgeteilt. Um eine auf dem XML Schema basierte XML-Datei zu erstellen, wurde die Menüoption *Datei* ⟶ *Neu* gewählt. Diese ruft ein Dialogfeld "Neues Dokument anlegen" auf, in dem der Eintrag *Extensible Markup Language* gewählt wurde (siehe Abbildung 11).

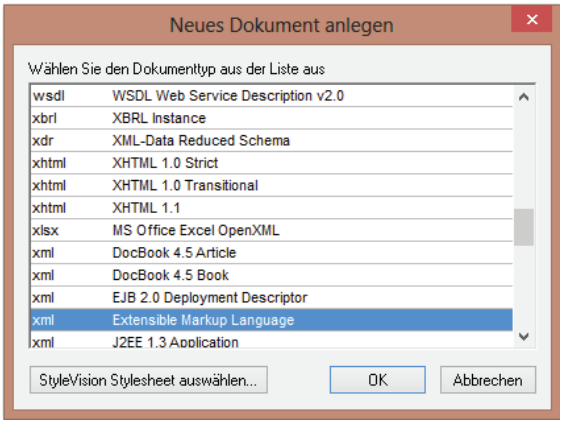


Abbildung 11 Ein Dialogfeld "Neues Dokument anlegen", Quelle: eigene Bearbeitung

In den nächsten Schritten wurde das XML Schema, auf dem die XML-Datei basieren soll und das entsprechende Root-Element gewählt. [IQ13, S. 56] Weiterhin wurde das XML-Dokument in der Textansicht bearbeitet. Die End-Tags und die Musterwerte wurden hinzugefügt.

Die Bearbeitung des XML-Dokuments erleichtert das Infofenster, indem die ausführlichen Informationen über die beliebigen Elemente angezeigt wurden. Die Abbildung 12 stellt die in dieser Weise erstellte XML-Datei dar, deren *CA_2DReflectanceTarget* das Wurzelelement ist.

```
1  <?xml version="1.0" encoding="UTF-8"?>
2  <CA_2DReflectanceTarget xmlns="http://example.com/ISO19159-1"
3                          xmlns:gml="http://www.opengis.net/gml/3.2"
4                          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
5                          xsi:schemaLocation="http://example.com/ISO19159-1 ISO19159-1.xsd"
6                          gml:id="GML_7b1a5a6f-ddad-4c3d-a507-3eb9ee0a8e68">
7    <calibrationType>laboratory</calibrationType>
8    <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
9    <lampType>type of illumination used</lampType>
10   <atmosphericCondition>state of the atmosphere</atmosphericCondition>
11   <aerosolQuantity>0.0</aerosolQuantity>
12   <numberPoints>0</numberPoints>
13   <expanse uom="#m">0.0</expanse>
14   <minimumElevation uom="#m">0.0</minimumElevation>
15   <maximumElevation uom="#m">0.0</maximumElevation>
16   <averageElevation uom="#m">0.0</averageElevation>
17   <linearSize uom="#m">0.0</linearSize>
18   <targetExpanse uom="#m">0.0</targetExpanse>
19   <shape>square</shape>
20   <material>awning</material>
21   <spectralCharacteristics>
22     <CA_Spectrum>
23       <numberBands>0</numberBands>
24       <wavelength uom="#m">0.0</wavelength>
25       <response>0.0</response>
26     </CA_Spectrum>
27   </spectralCharacteristics>
28   <measuredReflectance>
29     <CA_MeasuredReflectance>
30       <intensity>0.0</intensity>
31       <wavelength uom="#m">0.0</wavelength>
32       <zenithAngle uom="#m">0.0</zenithAngle>
33       <azimuth uom="#m">0.0</azimuth>
34     </CA_MeasuredReflectance>
35   </measuredReflectance>
36   <minimumNominalReflectance>0.0</minimumNominalReflectance>
37   <maximumNominalReflectance>0.0</maximumNominalReflectance>
38   <radiometricStability>description of the radiometric stability of the target</radiometricStability>
39   <cleanness>description of the cleanness of the target</cleanness>
40   <absoluteAccuracy>0.0</absoluteAccuracy>
41 </CA_2DReflectanceTarget>
```

Abbildung 12 Die XML-Datei mit dem Wurzelelement *CA_2DReflectanceTarget*, Quelle: eigene Bearbeitung

Damit ein XML-Dokument verwendet werden kann, muss es in jedem Fall wohlgeformt sein. Der Begriff der Wohlgeformtheit wurde im Kapitel 4.3.1. näher erläutert. Die Prüfung der Wohlgeformtheit von der XML-Datei wurde laut dem Kapitel 4.3.1. durchgeführt.

3.4.2 Validierung der XML-Datei gemäß dem XML Schema

Für eine weitere sinnvolle Anwendung dieses XML-Dokuments ist eine Gültigkeitsprüfung, die auch Validierung genannt wird, notwendig. Eine gültige XML-Datei folgt den Regeln, die in einem Regeldokument (in diesem Fall ist das XML Schema) angegeben sind. [14, S. 32] Die Prüfung auf Gültigkeit wurde mit Hilfe von Altova XMLSpy durchgeführt. Um die Gültigkeit einer XML-Datei zu überprüfen, wurde die Menüoption *XML⟶ XML valideren* gewählt. Das Validierungsergebnis wurde im Meldungsfenster angezeigt (siehe Abbildung 13). [IQ13, S. 65]

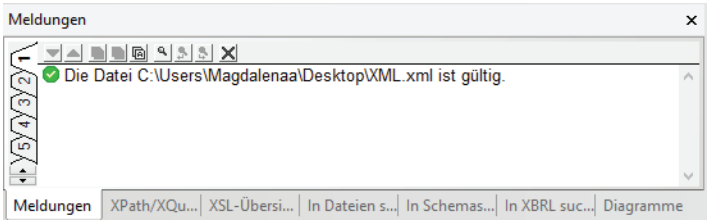


Abbildung 13 Ein Meldefenster mit dem Validierungsergebnis, Quelle: eigene Bearbeitung

Die vollständige XML-Datei entstand durch die Verknüpfung der einzelnen XML-Dokumente. Die erstellte Datei ist im Anhang A zu sehen.

3.5 Inhaltliche Analyse eines Kalibrierprotokolls

Um ein Konzept des Endprodukts vom Softwareprogramm auszuarbeiten, ist es sinnvoll, ein in der Praxis verwendetes Kalibrierprotokoll zu analysieren.

Das zur Untersuchung genutzte Kalibrierprotokolls wurde von der Firma ZI-Imaging zur Verfügung gestellt und betrifft die Digital Modular Camera (DMC) II 250. [14, S. 2] Die DMC II 250 basiert auf der DMC II und besteht aus fünf Kameraköpfen. Vier von denen sind Multispektralkameras für die Kanäle „Rot“, „Grün“, „Blau“ (RGB) und nahes Infrarot (NIR). Der fünfte Kamerakopf erzeugt das hochauflösende panchromatische Bild. [IQ14, S. 1]

Die Titelseite des Kalibrierprotokolls beinhaltet die Zertifikat-Identifikation und die Daten des Auftragsgebers. Die nächste Seite zeigt die Hauptinformationen bezüglich der Kalibrierung, wie Kameraname, ihre Seriennummer, Datum und Ort der Untersuchung sowie die Unterschriften der Personen, die für die Kalibrierung

und Zertifizierung zuständig sind. Dann wurden sowohl alle Kameraköpfe und ihre Seriennummern als auch Konfigurationsparameter der Testblöcke dargestellt. Auf den nächsten Seiten kommen die Ergebnisse der Aerotriangulation und der geometrischen Kalibrierung. Im Weiteren wurden die Ergebnisse der radiometrische Untersuchung für die einzelnen Kameraköpfen dargestellt. Das Kalibrierprotokoll enthält die Informationen über die geometrische Sensorgenauigkeit und maximal zulässige Sensorschäden. [IQ14, S. 1-40]

Auf Basis des in der Praxis verwendeten Kalibrierprotokolls wird das Endprodukt des in dieser Arbeit entwickelten Softwareprogramms entstehen. Dazu wird ein genauer Vergleich des Inhalts vom Kalibrierprotokoll mit der ISO-Norm benötigt. Den Elementen des Kalibrierprotokolls werden die entsprechenden Parameter aus der ISO-Norm zugewiesen. Die Komponenten, die keinem Parameter aus der Norm zugeordnet werden könnten, werden mit einem geeigneten Namen versehen und in einer getrennten Datei gespeichert.

Der detaillierte Vergleich führte zur Entstehung einer Textdatei mit den nichtgenormten Parametern, denen die Musterwerte zugewiesen werden (nach den Regeln im Unterkapitel 3.4.1 erwähnt). Im Anhang B ist die genannte Datei zu sehen.

3.6 Beschreibung der aufgetretenen Schwierigkeiten

In diesem Unterkapitel werden die während der Bearbeitungsphasen des Themas aufgetretenen Probleme beschrieben. Deswegen werden diese Schwierigkeiten in den entsprechenden Bereichen eingeteilt.

Während der inhaltlichen Analyse der ISO/TS Norm 19159-1 wurde das Auftreten der Unzulänglichkeiten in der Norm festgestellt. In der Norm wurden die redaktionellen Fehler erkannt. Die Namen der Parameter oder Klassen wurden in dem Anhang B der Norm getrennt aufgeschrieben, wie z.B. *numberOfPhotosAlongStrip* oder *CA_RadiometricDynamics* (siehe ISO/TS 19159-1, Seite 56 oder 70). Dadurch ist die Suche nach den Parametern und Klassen in der Norm erschwert. In dem Softwareprogramm werden die Parameternamen zusammengeschrieben. Im Anhang B wurden auch die falsche Nummerierung (siehe ISO/TS 19159-1 *geometricTangentialResolution*, Seite 81) und die falsche

Textformatierung der Klasse (siehe ISO/TS 19159-1 *CA_TargetEnvironment*, Seite 57) festgestellt. Im Anhang B wurden auch die mangelnden Klassen (z.B. *CA_DynamicRange* oder *CA_GeometricResolution*) und die mangelnden Beschreibungen der Attribute (z.B. *radiometricCalibrationDate* oder *calibrationMethod*) herausgestellt. Die nächsten Fehler betreffen die mangende Übereinstimmung des Parameternamens in dem Normtext und im Anhang B. Der Parameter *calibrationType* kann nur die bekennenden Werte aus der *Codelist* annehmen. Ein von diesen möglichen Werten wurde in dem Normtext in dem UML-Klassendiagramm *onboard* genannt. In dem Anhang B.9 wurde dieser Wert als *inFlight* definiert. Der nächste Unterschied zwischen dem Normtext und dem Anhang B wurde auch in Reihenfolge der Parameter in der Klasse *CA_Radiation* festgestellt. Die Erhaltung der einheitlichen Struktur der Klassen ist bei den weiteren Bearbeitungsphasen der Arbeit erforderlich. Eine weitere Diskrepanz liegt in der Zuordnung zwei vielfältiger Datentypen eines Parameters. Dieser Zustand betrifft den Parameter *certificateIdentification,* dem *MD_Identification* (in dem Normtext, Seite 48) und *MD_Identifier* (in dem UML-Klassendiagramm und Anhang B.8) zugewiesen wurden. Für diese problematischen Elemente der ISO-Norm wurden die Parameternamen, ihre möglichen Werte oder Datentype aus der Tabelle im Anhang B aufgenommen.

In der ISO/TS Norm 19159-1 wurden die Datentypen für einige Parameter definiert, die nur in den anderen Normen ausführlich beschrieben wurden. Diese Situation hat zur Analyse der weiteren Normtexte gezwungen. Zu den außerhalb der ISO/TS 19159-1 definierten Datentypen wurden die folgenden Elemente gezählt (siehe Tabelle 4).

Parametername	Beschreibung	Norm
MD_Identification	Basisinformationen erforderlich für die Identifizierung einer Quelle	ISO/FDIS 19115
MD_Identifier	Wert für die eindeutige Identifizierung des Objekts in einem Namensraum	ISO/FDIS 19115
CI_Citation	normalisierte Quellenreferenzen	ISO/FDIS 19115

CI_ResponsibleParty	Identifizierungs- und Kommunikationsmittel mit Personen und Organisationen verbunden mit dem Datensatz	ISO/FDIS 19115
MI_Band	Erweiterung des elektromagnetisches Spektrum, Wellenlängenbeschreibung	ISO/FDIS 19115-2
SD_PolynomialFunction	Funktion benutzte in dem Polynommodel	ISO/TS 19130
DQ_PositionalAccuracy	Genauigkeit der Position	ISO/CD 19157
DQ_QuantitativeAttribute-Accuracy	Genauigkeit der quantitativen Attributen	ISO/CD 19157

Tabelle 4 Aufstellung der außerhalb der ISO/TS 19159-1 definierten Datentypen, Quelle: eigene Bearbeitung anhand [6, S. 49, 71, 89, 90], [7, S. 35], [8, S. 82], [9, S. 49-50]

Die Untersuchung der oben erwähnten Normen zeigte einige Unklarheiten bezüglich der außerhalb der ISO/TS 19159-1 definierten Datentypen auf. In der ISO/FDIS 19115 wurde der Parameter *identifier* der Klasse *CI_Citation* in weiterer Reihenfolge durch *CI_Citation* entwickelt. Dem besseren Verständnis dieser Klassenstruktur dient die XML-Datei (siehe Abbildung 14), die gemäß der der ISO/FDIS 19115 erstellt wurde.

```
1  <CI_Citation>
2      <title>name by which the cited resource is known</title>
3      <alternateTitle>short name or other language name by which the cited information is known</alternateTitle>
4      <date>
10     <edition>version of the cited resource</edition>
11     <editionDate>
14     <identifier>
15         <MD_Identifier>
16             <authority>
17                 <CI_Citation>
18                     <title>name by which the cited resource is known</title>
19                     <alternateTitle>short name or other language name by which the cited information is known</alternateTitle>
20                     <date>
```

Abbildung 14 Knotenstruktur von *CI_Citation*, Quelle: eigene Bearbeitung

Zum Ziel der Problembehebung wurde dem Parameter *authority*, der für die Instandhaltung des Namensraums zuständige Person oder zuständigen Träger definiert,

einen Datentyp *String* zugewiesen. [6, S. 71] In der ISO/TS 19130 wurde die Eindeutigkeit des Klassennamens, der die in dem Polynommodel benutzte Funktion beschreibt, nicht beachtet. Dieses Element wurde als *SD_PolynomialFunction* oder *SD_Polynomial* bezeichnet. Aufgrund seiner Bedeutung und Bezeichnung in der ISO/TS 19159-1 wurde der zutreffendere Name — *SD_PolynomialFunction* bei den weiteren Arbeiten berücksichtigt.

Eine weitere Schwierigkeit in der ISO/TS 19159-1 betraf eine Klasse *SD_Attitude*, die in sich keine Parameter schließt, jedoch ein Obertyp für *SD_AngleAttitude* und *SD_MatrixAttitude* ist. In der ISO/TS 19130 wurde diese Klasse als Datenstruktur <<DataType>> bezeichnet, was laut Angabe in der Fachliteratur bedeutet, dass solche Klassen gewöhnlich einige einfache Attributen haben, deren Typen wiederum aus den primitiven Klassen oder Datentypen bestehen. [5, S. 75] Der Mangel an den Attributen in dieser Klasse *SD_Attitude* sperrt die Berücksichtigung ihrer Unterklassen sowohl bei der Bearbeitung des XML Schemas, als auch der XML-Datei. Um das Problem zu vermeiden, wurden zwei Parameter *angleAttitude* und *matrixAttitude* der Klasse *SD_Attitude* hinzugefügt.

Während der Analyse des XML Schemas wurden einige Schwierigkeiten festgestellt. Das XML Schema schließt in sich weitere zahlreiche Wurzelelemente ein. Aus diesem Grund entstand die vollständige XML-Datei durch die Verknüpfung der einzelnen XML-Dokumente, die mit Hilfe von Altova XMLSpy erstellt wurden. Um die syntaktischen Regeln der XML-Spezifikation zu erfüllen, wurde ein oberstes Element in der XML-Datei für diesen Wurzelknoten erstellt. Der den Vergleich des XML Schemas mit dem Norminhalt ermöglichte, um weitere Probleme zu entdecken. In dem Schema-Dokument wurden die Parameternamen gefunden, die sich mit den Parameternamen aus der Norm nicht decken. In der Norm wurde ein Parameter, das die anderen Detektormängel beschreibt, als *artefacts* definiert. Hingegen wurde es in dem XML Schema als *artifacts* bezeichnet. Die ähnliche Situation betrifft die Parameter *rotatedAxes, modelType* und *filterType*, die in dem Schema-Dokument entsprechend als *rotatedAxis, BRDFModel, filter* definiert wurden. In der im Softwareprogramm benutzten XML-Datei wurden die Parameternamen aus der ISO-Norm verwendet. Die weitere mangelnde Übereinstimmung tritt im Parametermaß auf. In dem XML Schema wurde

bespielweise der Parameter *targetAzimuth* oder *targetInclination* in *Meter* definiert. In der ISO/TS 19159-1 wurden diese Parameter jedoch als *Angle* bestimmt. In diesem Fall war die Suche nach einer Lösung des Problems nicht notwendig, weil die beiden erwähnten Maße als Datentyp *Double* festgelegt werden können. Das XML Schema definiert keine Datentypen für die Parameter wie z.B. *geometryCalibrationDate* oder *geometryCalibrationType.* Die nächste Schwierigkeit war das Auftreten der Elternknoten in dem XML Schema, die in der Norm nicht zu finden waren. Das bezieht sich auf acht folgende Elternknoten: *CA_BRDFModel*, *CA_Filter*, *CA_GeometricQuality, CA_OpticsSpatial*, *CA_RadiometricQuality*, *CA_Radiometry, CA_RadiometryCalibrationFacility* und *CA_TestField.* Diese Komponenten wurden bei der Bearbeitung der XML-Datei *Input* nicht berücksichtigt. Alle oben vorgestellte Diskrepanzen wurden geprüft. Daraus wurde eine Schlussfolgerung gezogen, dass diese Missverständlichkeiten auf zwei Ebenen existieren könnten. Nämlich hat das UML-Klassendiagramm, aus dem das XML Schema abgeleitet wurde, solche erwähnten Fehler enthalten oder die Ungleichartigkeit entstanden während der Bearbeitung des UML-Klassendiagramms durch ShapeChange.

Nach dem Erstellen der XML-Datei *Input* (mit Hilfe von Altova) wurde sie tiefgründig untersucht. Die Parameter der Elternknoten aus der XML-Datei wurden mit dem Normtext verglichen. In vielen Elternknoten waren die einzelnen Parameter nicht vorhanden. Diese fehlenden Parameter wurden anhand der Norm ergänzt.

Die erwähnten Schwierigkeiten traten beispielweise in den folgenden Elternknoten: *CA_Documentation*, *CA_Linearity*, *CA_LUT* oder *CA_RadiometryTestRange*, die in dem Schema-Dokument geprüft wurden. Durch die Untersuchung wurde festgestellt, dass die minimale Vorkommenshäufigkeit für diese Parameter einen Wert von 0 annimmt. Dadurch können diese Parameter notfalls fehlen. [11, S. 282-283] In dem benutzen Softwareprogramm Altova XMLSpy wurde im Voraus angenommen, dass diese Parameter in der XML-Datei nicht enthalten sein müssen. Für die Lösung der Aufgabenstellung dieser Masterarbeit ist jedoch das Vorkommen aller Parameter aus dem XML Schema

erforderlich. Die weitere Kontrolle der XML-Datei *Input* zeigte die Elternknoten ohne weitere Elemente auf. Diese Elternknoten wurden aus der Datei gelöscht.

Die Parameter, deren die maximale Vorkommenshäufigkeit einen bestimmten Wert annimmt, wurden in der XML-Datei verarbeitet. Die Änderung betraf die Erstellung der geeigneten Anzahl der bestimmten Parameter. Die neuen XML-Elemente wurden mit den entsprechenden Namen und weiteren Zahl versehen. Beispielweise wurde die maximale Vorkommenshäufigkeit für den Parameter *detectorSize* auf den Wert von zwei gesetzt. Diese Detektorgröße wurde in der XML-Datei als <detectorSize1> und <detectorSize2> definiert.

In der XML-Datei *Input* wurde die Missverständlichkeit der Parameter festgestellt. Die gleichen Parameternamen wurden bei der Bestimmung der Eigenschaften von den diversen Objekten benutzt, die in den verschiedenen Klassen einer oder mehrerer Normen definiert wurden. Zu diesen problematischen Parameternamen wurden beispielweise *wavelength*, *name*, *size* oder *description* gezählt. Die Missverständlichkeit der Parameternamen wurde auch durch die Nutzung des gleichen komplexen Datentyps (wie z. B. *MD_Identification*) für viele Parameter verursacht. Um die Eindeutigkeit solcher Parameter zu gewährleisten, wurden die Änderungen in der XML-Datei *Input* eingeführt. Jede mehrdeutige Parameterbezeichnung wurde zusätzlich mit dem Name ihres Elternknotens versehen. Wenn dieser problematische Parametername mehrmals in einem Elternknoten vorkommt, wurde er mit Hilfe von Zahlen unterschieden. In dem Fall, dass der problematische Parametername nur in einem Elternknoten auftrat, wurde er mit Hilfe vom Name des oberen Elements differenziert.

Während der tiefgründigen Analyse der XML-Datei *Input* wurden einigen Unklarheiten betreffend der Vererbung der Parametern in der ISO-Norm festgestellt. Eine Oberklasse bestimmt mit Hilfe von ihren Parameter die Informationen aus dem gewissen Kalibrierbereich. Als Spezialisierung dieser Oberklasse übernehmen die Unterklassen ihre Parameter und definieren eigene. Falls die Parameter der Oberklasse sich direkt auf die Unterklassen beziehen und ihre Werte sich in Abhängigkeit von der Art der Unterklasse ändern, sollen die Parameternamen in der XML-Datei *Input* für jede Unterklasse eindeutig sein. Die Änderung der Parameterbezeichnungen stellt die richtige Zuordnung des

Parameterwerts durch den Softwareprodukt sicher. Ein Beispiel dafür ist die Oberklasse *CA_InteriorOrientation* und ihre Unterklassen (siehe Abbildung 15).

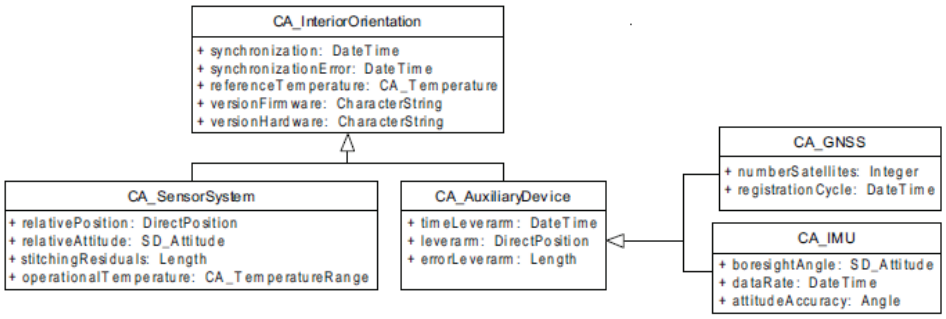


Abbildung 15 UML-Klassendiagramm der Klasse *CA_InteriorOrientation*, Quelle: [3, S. 18]

Die Unterklassen *CA_SensorSystem*, *CA_GNSS* und *CA_IMU,* die drei unterschiedliche Geräte charakterisieren, erben solchen Parameter wie zum Beispiel *synchronization,* deren Bezeichnung für alle Unterklasse gleich lautet. Jedoch kann der Parameter für jedes Gerät einen anderen Wert annehmen. Solche Vorgehensweise liefert mehrdeutige Informationen für eine Parameterbezeichnung. Diese Situationen wurden bei der Bearbeitung der XML-Datei *Input* berücksichtigt und die problematischen Parametername wurden durch das Hinzufügen des Elternknotennamens differenziert. Aufgrund der vielfältigen oben beschriebenen Änderungseinführungen in der XML-Datei *Input* ist diese Datei in Bezug auf das XML Schema nicht gültig.

Ein genauer Vergleich des Inhalts vom Kalibrierprotokoll mit der ISO-Norm offenbarte die diversen Schwierigkeiten. Den Elementen des Kalibrierprotokolls mussten die entsprechenden Parameter aus der ISO-Norm zugewiesen werden. Die manchen Komponenten konnten teilweise ein paar Parameter aus der Norm entsprechen.

In diesem Fall wurde der am meisten von allen passende Parameter gewählt oder ein neuer Parameter in der Datei *Others* erstellt. Einigen Komponenten konnten keinem Parameter aus der Norm zugeordnet werden, wie zum Beispiel die Kundendaten oder die für die Kalibrierung zuständigen Personen. Ein weiteres Beispiel bezieht sich auf die Konkretisierung der RMSE, für die im Kalibrierprotokoll die verschiedenen Arten dieser Abweichung platziert wurden. Die ISO-Normen sind grundsätzlich abstrakt angelegt, deshalb beinhalten

sie keine weiteren Details. Den Parametern sie mit einem geeigneten Namen versehen und in einer getrennten Datei *Others* in alphabetischer Reihenfolge gespeichert.

Bei der Zuordnung der Parameter wurde festgestellt, dass der Datentyp oder die maximale Vorkommenshäufigkeit, die in der Norm definiert wurden, für die Parameter an der praktischen Anwendung angepasst werden sollen. Um diese aufgetretenen Schwierigkeiten näher zu bringen, werden im Folgenden zwei problematische Beispiele für die Zuordnung der Parameter vorgestellt.

Im Kalibrierprotokoll wurde jedem Instrument, ein Gegenstand der Kalibrierung, seine Seriennummer zugeschrieben. In dem Normtext sind zwei Parameter zu finden, die eventuell die Seriennummer eines Instruments definieren könnten, nämlich *sensorIdentification* (*CA_Documentation*) und *identifier* (*MI_Instrument*). Jedoch wurden an diesen Parametern die Datentype (*MD_Identification*/ *MD_Identifier*) angepasst, die für die Beschreibung der Datensätze geeignet sind, deshalb wurde ein Parameter *serialNumber* als Zeichenkette in der Datei *Others* erstellt.

Im Kalibrierprotokoll wurden die Informationen für alle fünf Kameraköpfe gezeigt. Für die Beschreibung des Kamerakopfs ist der Parameter *cameraHead* zuständig, der laut der Norm nur einmal vorkommen darf. Um die anderen Kameraköpfe beschreiben zu können, wurde weitere Parameter für die anderen Kameraköpfe erstellt werden.

Das Hinzufügen der weiteren Parameter zu der Datei *Others* erweitert hauptsächlich die ISO-Norm 19159-1, weil die sich auf die Prozesse beziehen, betreffend die Kalibrierung von optischen Sensoren. Um die Redundanz der Parameter in der Normenreihe 19159 zu vermeiden, sollen die übrigen Parameter bei der Erweiterung der anderen Normen wie z. B. ISO/TS 19130 berücksichtigt werden.

Die weitere Schwierigkeit betrifft das Auftreten der Diagramme, der Ausschnitte aus den fachkundigen Softwareprogrammen und den anderen Abbildungen. Aufgrund des Mangels von den oben erwähnten Objekten für die anderen Kalibriersituationen werden diese grafischen Darstellungen in dem Softwarteprodukt nicht berücksichtigt. In den meisten Fällen werden stattdessen

die entsprechenden Parameternamen und ihre Werte in Form von einer Tabelle platziert.

3.7 Softwareproduktentwurf

Ein Computerprogramm ist formuliert in einer Programmiersprache zur Ausführung von Arbeitsschritten zur Lösung einer Problemstellung. Als Vorstufe zur Erstellung des Programms ist der Entwurf des Algorithmus erforderlich. [10, S. 17-18] Im Folgenden wird erklärt, was das zukünftige Softwareprodukt leisten soll.

Nach dem Aufruf des Programms werden drei XML-Dateien: mit den Parametern der ISO-Norm, mit zusätzlichen Parametren und mit den Datentypen von allen Parametern eingelesen. Die Erstellungs- und weitere Bearbeitungsweise der ersten zwei Dokumente wurde entsprechend in Kapitel 3.4. und 3.5. geklärt. In der zuletzt erwähnten Datei wurden die Parameter den folgenden Datentypen zugeteilt: *String*, *Date*, *Double*, *Integer* und *Boolean*. Für jeden Typ wurden zuerst die nichtgenormten, dann die aus den anderen Normen und schließlich die genormte Parameter zugeordnet. Diese Anordnung in jeder Parametergruppe erfolgte alphabetisch. Diese Datei ist im Anhang C zu sehen. Zum besseren Verständnis der Grundlagen der Bearbeitung von einzelnen Dokumenten wurde ein Schema bearbeitet (siehe Abbildung 16)

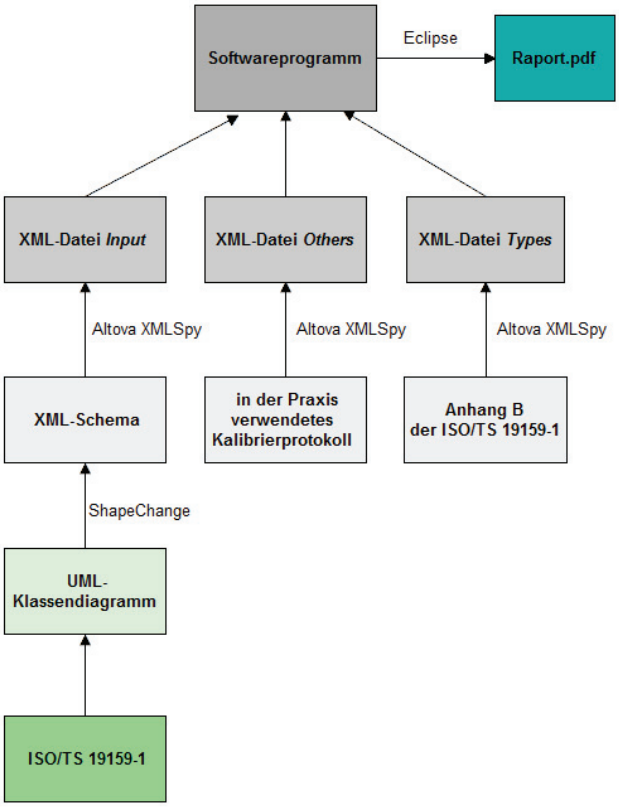


Abbildung 16 Bearbeitungsweise der einzelnen Dateien, Quelle: eigene Bearbeitung

Die Namen und Musterwerte von den Parametern werden dem Benutzer angezeigt. Nach der Auswahl des gewünschten Parameters kann sein Wert verändert werden. Jedoch muss der Datentyp des eingegebenen Werts beachtet werden, weil die Datentypen für die Parameter in der ISO-Norm vorgegeben sind. Die zulässigen Wertebereiche der einzelnen Parameter wurden auch in der ISO/TS-Norm 19159-1 bestimmt. Auf dieser Grundlage kann das Programm die Eingabe der falschen Werte verhindern. Mit Hilfe des Softwareprodukts kann ein Kalibrierprotokoll erstellt werden. Dieses Dokument soll die Gestalt des in der Praxis verwendeten Kalibrierprotokolls annehmen.

Um den Überblick über den Softwareproduktentwurf zu behalten und eine Struktur des Programms vorzubereiten, wurde eine grafische Darstellung in Form eines Programmablaufplans (siehe Abbildung 17) herausgearbeitet. [10, S. 19] Diese unten gezeigte Struktur des Softwareprodukts wird im folgenden Kapitel verfeinert und ausführlich beschrieben.

Abbildung 17 Programmablaufplan des Softwareproduktentwurfs, Quelle: eigene Bearbeitung

4. Implementierung

Als den Prozess der Implementierung bezeichnet man die Realisierung des Entwurfs in einer bestimmten Programmiersprache. [10, S. 23] In diesem Kapitel wird die Umsetzung des in den vorangegangenen Kapiteln beschriebenen Programmentwurfs
in der Programmiersprache Java beschrieben. Zunächst wird der Quelltext des Programms und der Benutzeroberfläche beschrieben. Außerdem wird die Testnutzung mit dem Einfügen von Werten und der Erstellung des Kalibrierungsprotokolls dargestellt.

4.1 Softwareprodukt

Der Quellcode des Programms wurde in der Programmiersprache Java mit Hilfe von Eclipse geschrieben. Der Quelltext des Softwareprogramms befindet sich im Anhang D.
Im ersten Schritt wurde eine Arbeitsumgebung vorbereitet. Es wurde ein neues Java Projekt (*RaportGenerator*) erstellt, in dem alle bei der Programmerstellung erzeugten Dateien gespeichert wurden. Aufgrund des Umfangs des Programms besteht der Quellcode aus mehreren Klassen. Jede einzelne Klasse wurde in einer eigenen Datei definiert. Der Programmtext wurde in folgenden Dateien aufgeteilt:

- *RaportGenerator.java*
- *Program.java*
- *Parameter.java*
- *ParameterType.java*
- *Pair.java*
- *PageGenerator.java*
- *FileContents.java*

Um diese Quellcodedateien zusammenzufassen und die Verwaltung des Programms zu vereinfachen, wurde ein Package *raport_generator* erzeugt. [10, S. 161]
Der Einstiegspunkt in ein Java-Programm weist immer die Hauptmethode (siehe Abbildung 18). [10, S. 43] Diese *main*-Methode wurde in der Datei

RaportGenerator.java als Rückgabetype *void* deklariert, dadurch liefert sie keinen Wert als Ergebnis. [16, S. 151]

```
1  package raport_generator;
2
3  public class ReportGenerator {
4      public static void main(String[] args) {
5          program.setInputXmlPath("C:\\Report\\Input.xml");
6          program.setTypesXmlPath("C:\\Report\\Types.xml");
7          program.setOthersXmlPath("C:\\Report\\Others.xml");
8          program.setOutputPdfPath("C:\\Report\\Report.pdf");
9          program.initParameters();
10         manualInitialization();
11         program.getValuesFromUser();
12     }
13
```

Abbildung 18 Der Einstiegspunkt in ein Java-Programm, Quelle: eigene Bearbeitung

Bei dieser Methode wurden die Pfade zu den einzelnen Außendateien definiert, die sich in dem Verzeichnis *Report* auf der Festplatte befinden. Zu diesen Außendateien gehört die XML-Datei mit den Parametern der ISO-Norm (*Input*), das XML-Dokument mit zusätzlichen Parametren aus dem in der Praxis verwendeten Kalibrierprotokoll (*Others*), die XML-Datei mit den Datentypen von allen Parametern (*Types*) und das mit Hilfe von dem Softwareprodukt erstellte Kalibrierprotokoll (*Report*). Die Erstellungs- und weitere Bearbeitungsweise der Dateien wurde entsprechend in Kapitel 3.4., 3.5. und 3.6. geklärt.

In der Quellcodedatei *Program.java* wurde die Methode *_checkFile* aufgerufen, die ausführlich in der Zeile 172 definiert wurde. Diese Methode prüft, ob die Dateien *Others*, *Types* und *Report* in dem geeigneten Verzeichnis existieren. Es wird kontrolliert, ob nur die Ablesung der Dateien oder noch der Eintrag in der Datei möglich ist. Falls Probleme auftauchen sollten, werden entsprechende Fehlermeldungen angezeigt.

In der Hauptmethode wurden auch die anderen Methoden wie *initParameters()*, *manualInitialization()* und *getValuesFromUser()* abgerufen. Die erste erwähnte Methode wurde in der Quellcodedatei *Program.java* definiert. Hier wurde eine leere Liste (Array-Liste) für den Typ *Parameter* erzeugt. In der Liste werden Objekte gespeichert, die über ganzzahlige Indexwerte angesprochen werden können. Die Indexwerte zählen beginnend mit dem Wert 0 hoch. [10, S. 347] *Parameter* wurde als eine Klasse definiert, die sich in einer getrennten Quellcodedatei *Parameter.java* befindet. Diese Klasse beschreibt mehrere

Informationen betreffend den Parametern unter anderem den Name, die Anzahl der möglichen Werte oder den erwarteten Datentyp. Die Datentypen wurden in dem Quellcodedokument *ParameterType.java* definiert. Diese beiden erwähnten Quellcodedateien werden ausführlich im weiteren Verlauf der Arbeit beschrieben.

Mit Hilfe von *initParameters* wurden die Methoden abgerufen, die die Datentypen von Parameter (*_loadParameterTypes()*), die nichtgenormten und genormten Parameter (entsprechend: *_loadOtherParameters()* und *_loadMainParameters()*) einlesen.

Die Methode *_loadParameterTypes()* öffnet das Dokument mit den Datentypen von Parameter (*Types*) und nimmt die Liste von den Datentypen auf. Mit Hilfe von der Methode *getDocument* wird die XML-Datei geöffnet. Diese Methode gibt diese Datei in Form vom Objekt der Klasse *Dokument* aus. Zuerst wird die *Document Builder Factory* lokalisiert. In der Zeile 467 weist die *Factory* an, einen *Document Builder* zu erstellen. Dann wird die Datei geöffnet, die sich in dem Pfad befindet, um sie auf Fehler zu überprüfen. Der Parser meldet jeden Fehler, auf den er in der Datei trifft. [17, S. 542-543]

In dem Quellcode der Methode *_loadParameterTypes()* wurde die *NodeList* benutzt, die alle Knoten der Datei *Types* der Reihenfolge nach enthält. [IQ15] Es werden alle Knoten der XML-Datei auch Attribute berücksichtigt. Um die Bearbeitung der Attribute zu vermeiden, prüft die Methode, ob der aktuell aufgenommene Knoten den Typ *ELEMENT_NODE* besitzt. Solcher Typ ist charakteristisch für den Tag in dieser Art: <Beispiel>. Wenn die For-Schleife den Typ *ELEMENT_NODE* definiert, wurde für den *currentElement* *<type>* die Elementenliste *<name>* und *<parameter>* aufgenommen. Mit Hilfe von der Methode *_paramTypeMap* wurde für den Parameter der Datentyp definiert. Bei dieser Methode wird eine *LinkedHashMap* verwendet, die einen schnelleren Assoziativspeicher anbietet. In diesem Fall dient der Parametername als Index, der dem Datentyp zugeschrieben wird. In der Methode *_loadParameterTypes()* wurde eine *try-catch* Struktur platziert, die auf eine eventuell auftretende Ausnahmesituation reagieren wird. Der Inhalt der Fehlermeldung wird durch *getLocalizedMessage()* bestimmt.

Die Methode *_loadOtherParameters()* wurde auf der Basis von *_loadParameterTypes()* konstruiert. Jedoch benutzt die Methode

_loadOtherParameters() die XML-Datei (*Others*), aus der die Liste von den nichtgenormten Parametern aufgenommen wird. Hier werden nur die Kinderknoten angewendet, die der Array-Liste *_parameters* als neue Parameter hinzugefügt werden. An dieser Stelle wurde die Methode *_getParameterType()* verwendet, die den Datentyp des Parameters zurückgibt. Diese Methode stützt auf die oben beschriebene Methode *_paramTypeMap.*

Die Vorgehensweise in der Methode *_loadMainParameters()* ist weitergehend übereinstimmend mit dem oben dargestellten Ablauf von *_loadOtherParameters().* Die Methode basiert jedoch auf den genormten Parametern aus der XML-Datei *Input* und auf die Untersuchung, ob diese Datei überhaupt in dem Verzeichnis *Report* existiert. Falls diese XML-Datei *Input* sich in dem Verzeichnis nicht befinden sollte, wird sie anhand des Dokuments *FileContents.java* erstellt, das den vollständigen Inhalt der XML-Datei *Input* enthält. Es wurde auch die Textformatierung der XML-Datei berücksichtigt.

Zurück zur Vorgehensweise der Methode *_loadMainParameters()* wird die rekursiv definierte Methode *_loadMainParametersRecursive()* für jeden untersuchten Knoten aufgerufen. Diese Methode kontrolliert, ob das untersuchte Element ein Elternknoten ist. Zuerst wird geprüft, ob der Parameter mit den entsprechenden Namen schon existiert. Wenn der Parametername noch nicht vorkam, wird er erstellt. Dann wird der Knoten untersucht, ob er die Kinderknoten besitzt. Für jeden Elternknoten werden seine Kinderknoten aufgenommen. Der Elternknoten wird ein Container, der keine eigenen Eigenschaften besitzt, angesichts dessen als sein Standardwert wird *EXPAND* angeordnet. Dann wurde die Methode *_loadMainParametersRecursive()* rekursiv aufgerufen. Wenn der Knoten keine Kinderknoten besitzt, wird ihn mit Hilfe von *_getParameterType()* ein Datentyp zugeordnet.

In der Methode *manualInitialization()* wurde der manuelle Eintrag der Parametereigenschaften beschrieben. Die Methode *setPossibleValues()* ermöglicht die Bestimmung der in der Norm definierten Werte für die einzelnen Parameter. Mittels der Methode *setMultipleValues()* wurden die Parameter definiert, die unendlich viele Werte annehmen können. Diese Methode wurde sowohl für den Aufruf des einzelnen Parameters als auch für die gleichzeitige Anordnung einer

beliebigen Anzahl von Parametern. In den beiden Methoden wird die Methode *_getParameterOfName()* für das Aussuchen und die Zurückgabe des eingegebenen Parameternamens verwendet. Der ausführliche Quellcode für die Methoden *setPossibleValues()* und *setMultipleValues()* befindet sich in der Datei *Program.java* (Zeile 75 und 82).

In der Hauptmethode wurde durch *getValuesFromUser()* das Menü eröffnet, in dem der Benutzer die Werte für die Parameter einfügen kann. Diese Methode wurde in der Quellcodedatei *Program.java* (Zeile 130) definiert. Zuerst wurden mit Hilfe von *_printPossibleParameters()* die Parameter aufgelistet, die von dem Benutzer editiert werden können. Die For-Schleife nimmt die Parameter aus der Array-Liste auf. Die Kinderknoten werden an dieser Stelle nicht berücksichtigt. Dann wurde die Methode *_formatParameter()* aufgerufen, die dem Benutzer das angezeigte Feld mit den Parameterdaten formatiert. Das Feld nimmt die folgende Gestalt "[Parameter ID] Parametername [Parameterwert]" an (siehe Abbildung 19).

```
[1] bibliography [description of the used books or other studies such as journal articles]
```

Abbildung 19 ein Feld mit den Parameterdaten, Quelle: eigene Bearbeitung

Außerdem liefert die Methode *_printPossibleParameters()* folgende Meldung *EXIT* und *Generate a report* zurück. Um dem Benutzer seine Position im Menü zu weisen, wurde die Methode *_printHierarchyPosition()*erstellt.

Im nächsten Schritt der Methode *getValuesFromUser()* wurde ein Objekt *scanner* der Klasse *Scanner* erzeugt, um die Tastatureingabe als Datenquelle benutzten zu können. Solange der Benutzer die Taste *EXIT* nicht wählt, werden die weiteren Konsoleneigaben in das Programm eingelesen. Wenn der Benutzer sich für *Generate a report* entscheidet, wird die Methode *_generateReport()* aufgerufen. Zuerst wird ein neues PDF-Dokument mit der Blattgröße A4 in dem angegebenen Pfad erstellt. Nach dem Öffnen der Datei wird das Kalibrierprotokoll mit Hilfe von der Konstruktor *PageGenerator* und der Methode *generateReport()* erstellt. Diese Methoden wurden in der Quellcodedatei *PageGenerator* definiert. Dieser Quelltext der Datei *PageGenerator* wird im weiteren Verlauf der Arbeit ausführlich beschrieben. Nach dem Erstellen des Rapports holt der Benutzer Erkundigungen darüber ein, auch im Fall eines Misserfolgs. Diese Methode *_pressEnterKey()*

ermöglicht die Fortsetzung der Werteneingabe in das Programm. Diese eingegebenen Werte werden als Objekt *value* gespeichert. Um diese Zeichenkette in numerische Werte umzuwandeln, wurde parse-Methode verwendet. [16, S. 358] In Betreff des Vorkommens der Container für die anderen Parameter wurde die Methode *_parametersStack* erstellt, die die Elternknoten auf den Stapel zurücklegt, in dem Maß, wie die Kinderelemente angezeigt werden. Um die Vorgehensweise mit dem Parameter, der sich auf der Stapelspitze befindet, zu bestimmen, wurde die Methode *_processCurrentParameter()* eingeführt. Zuerst wird der auf der Stapelspitze liegende Parameter entnommen. Wenn der Parameter als ein Elternelement erkannt wird, wird die Benutzerposition in der Parameterhierarchie zugewiesen. Die Kinderelemente werden mit Hilfe von *_getChildParameters()* zurückgegeben und dann mit Unterstützung von der Ausgabestrom *System.out* aufgelistet. Es wird auch die Rückwärtstaste angezeigt. Danach werden die weiteren Werte von dem Benutzer aufgenommen. Wenn die Taste *Backwards* gewählt wird, wird das letzte Element aus der Stapelspitze genommen. Falls irgendwelche Parameter sich noch auf der Stapelspitze befinden werden, wird die Methode *_processCurrentParameter()* rekursiv abgerufen. Diese Methode nimmt die weiteren Werte von dem Benutzer auf. Für den Fall, dass die Taste *Backwards* nicht gewählt wird, wurde angenommen, dass der Benutzer eine Zahl eingegeben hat. Dann wird die Methode *_getParameterOfId()* initiiert. Diese Methode sucht den Parameter nach der vom Benutzer eingeführten ID in der Array-Liste aus und gibt diesen Parameter zurück. Das Softwareprodukt prüft, ob der gewählte Parameter (*childParameter*) ein Kinderknoten des auf der Stapelspitze liegenden Elements ist. Falls diese Situation vorkommen sollte, wird der Parameter dem Stapel hinzugefügt und die Methode *_processCurrentParameter()* rekursiv aufgerufen. Diese Methode nimmt die weiteren Werte von dem Benutzer auf. Wenn der Stapel leer sein wird, wird das bedeuten, dass der Benutzer sich auf dem Hierarchiegipfel befindet. Dann werden alle Parameter, die keine Elternknoten besitzen, dem Benutzer angezeigt, das macht die oben erwähnte Methode *_printPossibleParameters().* In dem Quellcode wurde auch solche Situation berücksichtigt, in der eine falsche ID eingetragen wird. In diesem Fall wurde die

Fehlermeldung angezeigt und die Methode *_processCurrentParameter()* rekursiv abgerufen, um den richtigen ID-Wert in das Programm einzuführen.

Wenn der Parameter als kein Elternelement erkannt wird, wird geprüft, ob ihm viele Werte zugeschrieben werden können. Wenn diese Situation vorkommt, werden alle zulässigen Werte angezeigt. Dann wird der Wert von dem Benutzer eingetippt. Wenn dieser eingegebene Wert sich auf der Liste mit den möglichen Werten befindet, wird er dem Parameter zugeschrieben. An dieser Stelle werden zwei Arten von den Parametern unterschieden: mit einem zulässigen Wert oder mit vielen erlaubten Werten. Die Methoden, die sich mit der Werteneinstellung für die Parameter beschäftigen, sind entsprechend *_processSingleValueParameter()* und *_processMultipleValuesParameter()*. Die Grundlage für diese Methoden ist die Array-Liste *getValues.* Diese Liste speichert alle Parameternamen und ihre von dem Benutzer eingegebenen Werte. Die Methode *_processSingleValueParameter()* funktioniert folgendermaßen: nach dem Werteeintragen, wird geprüft, ob der Wert das erste Mal in das Programm eingeführt wird. Im Fall der Bestätigung wird der Wert gleich in die Liste eingetragen. Falls der Wert für diesen Parameter schon früher eingestellt wurde, wurde ihm der Index 0 zugeschrieben. Das wird bei der Wertänderung berücksichtigt.

Nach dem Werteintragen mit Hilfe von einer aus diesen zwei genannten Methoden (*_processSingleValueParameter()* oder *_processMultipleValuesParameter()*) wird das Element aus dem Stapel genommen. In dem Quellcode wurde auch solche Situation berücksichtigt, falls ein falscher Wert eingetragen wird. In diesem Fall wurde die entsprechende Fehlermeldung angezeigt und die Methode *_processCurrentParameter()* rekursiv abgerufen, um den richtigen Parameterwert in das Programm einzuführen.

Wenn der Parameter als kein Elternelement erkannt wird und ihm ein Wert zugeschrieben werden kann, wird die Information über den erwarteten Datentyp für den Parameter angezeigt. Danach wird der Wert von dem Benutzer aufgenommen. Um diese Zeichenkette in numerische Werte umzuwandeln, wurde parse-Methode verwendet. In dem Quellcode wurde der Fall berücksichtigt, wenn ein Wert vom falschen Datentyp eingetragen wird. Dann wird die entsprechende Fehlermeldung angezeigt und die Methode *_processCurrentParameter()* rekursiv

abgerufen, um ein Wert vom richtigen Datentyp in das Programm einzuführen. Nach dem richtigen Werteintragen wird dieser Wert für den geeigneten Parameter zugeschrieben. Wenn der Stapel leer sein wird, wird das Element aus dem Stapel genommen. Danach wird die Methode *_processCurrentParameter()* rekursiv abgerufen.

Zurück zur Vorgehensweise der Methode *getValuesFromUser()* werden nach dem richtigen Werteintragen und seiner Speicherung alle Parameter aufgelistet. In der Methode *getValuesFromUser()* wurde die Möglichkeit erwägt, dass der Benutzer keine Zahl eingegeben hat und keine EXIT-Taste gewählt hat. In diesem Fall wird die Fehlermeldung *Improper value was given* angezeigt.

In der Quellcodedatei *RaportGenerator.java* in der Zeile 271 wurde die Methode final aufgerufen, die ein Objekt nur einmal erstellt, in diesem Fall ist das Objekt *program* vom Datentyp Programm. In der Hauptmethode wurde nur die Methode des Objektprogramms aufgerufen, anstatt den ganzen Quellcode der Methode in der Datei *RaportGenerator.java* zu platzieren.

Der Quelltext der erwähnten Datei *PageGenerator.java* wird unten beschrieben. Dem Dokument wurden einige import-Anweisungen zugeschrieben (siehe Abbildung 20, Zeile 3- 13).

```
1  package report_generator;
2
3  import com.itextpdf.text.Chunk;
4  import com.itextpdf.text.DocumentException;
5  import com.itextpdf.text.Font;
6  import com.itextpdf.text.FontFactory;
7  import com.itextpdf.text.Paragraph;
8  import com.itextpdf.text.Phrase;
9  import com.itextpdf.text.pdf.BaseFont;
10 import com.itextpdf.text.pdf.PdfPCell;
11 import com.itextpdf.text.pdf.PdfPTable;
12 import com.itextpdf.text.pdf.draw.LineSeparator;
13 import java.util.ArrayList;
14
15 public class PageGenerator {
```

Abbildung 20 import-Anweisungen in der Datei *PageGenerator.java*, Quelle: eigene Bearbeitung

In den Quellcodedateien *Programm.java* und *Parameter.java* sind solche Grundelemente auch zu finden. Diese import-Anweisungen definieren eine Klasse aus einem Paket, die nicht in einem Standard-Paket liegt. Um diese beim Programmstart einladen zu können, wird diese Klasse explizit namentlich durch die import-Anweisungen bekannt gemacht. [16, S. 47] Beim Mauszeiger-Auffahren

auf der entsprechenden import-Anweisung werden die ausführlichen Informationen darüber angezeigt.

In der Datei *PageGenerator.java* wurden mit Hilfe der Methode *generateReport*() nur die Methoden aufgerufen, die die einzelnen Seiten des Kalibrierprotokolls erstellen. Jede Methode wurde an das individuelle Aussehen der Seite des Kalibrierprotokolls angepasst. Dabei wurde sowohl der Inhalt als auch die Textformatierung berücksichtigt. Aufgrund des Umfangs der Methode *generateReport*() werden in dieser Arbeit nur die Hilfsmethoden der Textformatierung und die Werteaufnahme der Parameter dargestellt.

Eine von diesen Methoden ist *_createCell()*, die eine Tabellenzelle erstellt. Zuerst wird geprüft, ob der eingegebene Text als ein Parametername anerkennt werden kann. Wenn solche Situation vorkommt, wird die Methode *getFirstValueOfParameter()* aufgerufen, die in der Quellcodedatei *Program.java* definiert wurde. Diese Methode gibt den ersten Parameterwert zurück, der sich auf der Liste aller Werte des entsprechenden Parameters befindet. Gesetzt den Fall, dass kein Wert für den Parameter bestimmt wurde, wird zu der erwähnten Liste nur der Standardwert zugeschrieben.

Wenn der vom Benutzer eingegebenen Text als kein Parametername anerkennt werden kann, wird er in der Tabellenzelle eingeschrieben. Die Methode *_createCell()* bestimmt die Spaltenanzahl, über die eine Zelle ausgedehnt wird, und das Vorhandensein der Rahmenzelle.

Die nächste Hilfsmethode der Textformatierung ist die Methode *_createPair()*, die ein neues Paar erzeugt. Das kann mit einer so genannten generischen Klasse realisiert werden. Diese Klasse wurde in dem Quellcodedokument *Pair.java* platziert. Im Kopf der Klassendefinition wurden die Namen aller Typ-Variablen (X und Y) definiert. Diese Typ-Variablen wurden entsprechend als *key* und *value* bezeichnet, aber sie können weiterhin beliebige Datentypen annehmen. [16, S. 332]

Die Vorgehensweise der Methode *_createPair()* besteht darin, dass die Methode *_createCell()* zweimal aufgerufen wird. Zuerst wird eine Zelle mit dem Parameternamen erstellt, dann wird eine Zelle mit dem Parameterwert erzeugt.

Mit Hilfe der Methode *_generatePairListTable()* wird eine Array-Liste von den Parametern (in Form von: Parametername+ Wert) in eine Tabelle eingesetzt. Bei dem Erstellen der Tabelle werden die folgenden Tabellenformatierungen berücksichtigt: das Vorhandensein der Rahmentabelle, der Prozentanteil und die Ausrichtungsweise einer Tabelle gegenüber der Seite. Für jedes Paarelement aus der Liste wird der Tabelle eine Zelle hinzugefügt. Mit Hilfe der Methode *getKey()* wird der Parametername aus dem Paar aufgenommen. Wenn der Wert eingetippt wurde, wird er einer neuen Zelle mittels der Methode *getValue()* hinzugefügt. Diese Methoden wurden ausführlich in der Quellcodedatei *Pair.java* definiert.

In der Quellcodedatei *PageGenerator.java* wurden die häufig benutzten Schriftarten in Form von Fontobjekten definiert. Hier wurde das Programmobjekt und das Dokument zugeschrieben.

Bei der Erstellung des Kalibrierprotokolls wird auch die Methode *getValuesOfParameterAsString()* aufgerufen, die in der Quellcodedatei *Program.java* definiert wurden. Diese Methoden erlaubt in das Kalibrierprotokoll eine bestimmte Zahl der Werte von dem Parameter zu platzieren.

Das oben erwähnte Quellcodedokument *Parameter.java* liefert verschiedene Informationen betreffend der Parameter unter anderem den Namen, die ID, die Anzahl der möglichen Werte, die Liste der verfügbaren Werte, den Standardwert oder den erwarteten Datentyp. Die Arten der Datentypen, die die Parameter annehmen können, wurden in der Quellcodedatei *ParameterType.java* als Aufzählungstyp definiert. In diesem Aufzählungstyp wird eine ganz bestimmte Menge von Werten gespeichert. [16, S. 324] Außerdem werden auch die zusätzlichen Informationen über den Namen der *enum*-Objekte als Zeichenkette aufbewahrt.

Der Quelltext von *Parameter.java* stützt auf der Getter-Methode, die die Auskunft über den aktuellen Wert eines Attributes (über die Methode *get*()) gibt. Um die Einführung der Änderungen an den Attributen zu beschränken, wurde die Setter-Methode in dem Quellcode nicht erstellt. [10, S. 205]

4.1. Benutzeroberfläche

Die Benutzeroberfläche ist eine Schnittstelle zwischen dem Benutzer und dem System. Alle Funktionen des Softwareprogramms sind in dem Consolefenster von Eclipse angezeigt und nur über die Tastatur erreichbar.

4.1.1 Layout des Hauptmenüs

Nach dem Aufruf des Softwareprogramms werden in der ersten Reihe die Parameter aus der XML-Datei *Others* angezeigt. Nach denen werden die Elternknoten aus dem XML-Dokument *Input* aufgelistet. Jedem Element wurde die einzigartige ID und ein Standardwert zugeschrieben. Den Elternknoten wurde die Information *Expand* angeordnet. Das Softwareprogramm zeigt auch die weiteren verfügbaren Optionen wie *EXIT* und *Generate a report*. Der Benutzer wird darüber informiert, in welchem Elternknoten er sich derzeit befindet. Das Layout des Hauptmenüs ist in Abbildung 21 zu sehen.

```
[1] bibliography [description of the used books or other studies such as journal articles]
[2] calibrationDateCameraHead1 [1-09-2015]
[3] calibrationDateCameraHead2 [1-09-2015]
[4] calibrationDateCameraHead3 [1-09-2015]
[5] calibrationDateCameraHead4 [1-09-2015]
[6] calibrationDateCameraHeadReference [1-09-2015]
[7] calibrationResult [information about the result of the calibration]
[8] cameraHead1 [name of camera head1]
[9] cameraHead2 [name of camera head2]
[10] cameraHead3 [name of camera head3]
[11] cameraHead4 [name of camera head4]
[12] cameraHeadReference [name of camera head (reference)]
[13] cameraName [name of camera which was calibrated]
[14] ccdRevision [0]
[15] columnCameraHead1 [0]
[16] columnCameraHead2 [0]
[17] columnCameraHead3 [0]
[18] columnCameraHead4 [0]
[19] columnPAN [0]
[20] compersationOfLightFallOff [0]
    ...
[1018] CA_SensorMeasurement [Expand...]
[1021] CA_SensorParameters [Expand...]
[1033] CA_SensorPostProcessing [Expand...]
[1035] CA_SensorQualityEvaluation [Expand...]
[1058] CA_SensorSystem [Expand...]
[1096] CA_Siemensstar [Expand...]
[1106] CA_Spectrum [Expand...]
[1110] CA_Target [Expand...]
[1124] CA_Temperature [Expand...]
[1126] CA_TemperatureRange [Expand...]
[1133] CA_TestRange [Expand...]
[1155] MI_Instrument [Expand...]
[1217] SD_AngleAttitudeSD_AngleAttitude [Expand...]
[1223] SD_ArrayDimension [Expand...]
[1258] SD_DetectorArray [Expand...]
[1276] SD_DistortionPolynomial [Expand...]
[1277] SD_DistortionTable [Expand...]
[1285] SD_MatrixAttitude [Expand...]
[1295] SD_OpticalSystem [Expand...]
[1296] SD_Sensor [Expand...]
[e] EXIT
[g] Generate a report PDF
Currently it is in: [root]
```

Abbildung 21 Das Layout des Hauptmenüs, Quelle: eigene Bearbeitung

4.1.2 Hinzufügen der Daten

Um den Wert für einen Parameter in das Softwareprogramm einzufügen, soll der Nutzer zuerst die entsprechende ID mit Hilfe von der Tastatur eingeben. Jede Eingabe in das Programm muss mit der Taste *Enter* auf der Tastatur bestätigen werden. Wenn diese ID dem Elternknoten zugeschrieben wurde, werden dem Benutzer seine aktuelle Position, die Kinderelemente und die Taste *Backwards* aufgezeigt (siehe Abbildung 22).

```
Currently it is in: [root->CA_2DReflectanceTarget]
[255] calibrationType [laboratory]
[256] radiometricCalibrationDate [1-09-2015 12:00:00]
[257] lampType [type of illumination used]
[258] atmosphericConditionCA_RadiometryInFlight [state of the atmosphere]
[259] aerosolQuantity [0.0]
[260] numberPoints [0]
[261] controlPointCA_RadiometryTestRange [0.0]
[262] expanse [0.0]
[263] minimumElevationCA_RadiometryTestRange [0.0]
[264] maximumElevationCA_RadiometryTestRange [0.0]
[265] averageElevationCA_RadiometryTestRange [0.0]
[266] linearSize [0.0]
[267] targetExpanse [0.0]
[268] shapeCA_2DReflectanceTarget [square]
[269] material [awning]
[270] spectralCharacteristicsCA_2DReflectanceTarget [Expand...]
[275] measuredReflectance [Expand...]
[281] minimumNominalReflectance [0.0]
[282] maximumNominalReflectance [0.0]
[283] radiometricStability [description of the radiometric stability of the target]
[284] cleanness [description of the cleanness of the target]
[285] absoluteAccuracy [0.0]
[e] Backwards
```

Abbildung 22 Wahl den Elternknoten, Quelle: eigene Bearbeitung

In dem Fall, dass der Knoten weitere Elemente in sich schließt, werden die nach der ID-Eingabe aufgelistet. Wenn der Parameter auf der niedrigsten Ebene lokalisiert wurde, wird den zulässigen Datentyp (siehe Abbildung 23) oder die Liste der möglichen Werte (siehe Abbildung 24) für den ausgewählten Parameter angezeigt. Nach dem Einfügen des richtigen Werts wird er in den eckigen Klammern neben den Parameternamen gezeigt (siehe Abbildung 25).

```
Currently it is in: [root->CA_2DReflectanceTarget]
[255] calibrationType [laboratory]
[256] radiometricCalibrationDate [1-09-2015 12:00:00]
[257] lampType [type of illumination used]
[258] atmosphericConditionCA_RadiometryInFlight [state of the atmosphere]
[259] aerosolQuantity [0.0]
[260] numberPoints [0]
[261] controlPointCA_RadiometryTestRange [0.0]
[262] expanse [0.0]
[263] minimumElevationCA_RadiometryTestRange [0.0]
[264] maximumElevationCA_RadiometryTestRange [0.0]
[265] averageElevationCA_RadiometryTestRange [0.0]
[266] linearSize [0.0]
[267] targetExpanse [0.0]
[268] shapeCA_2DReflectanceTarget [square]
[269] material [awning]
[270] spectralCharacteristicsCA_2DReflectanceTarget [Expand...]
[275] measuredReflectance [Expand...]
[281] minimumNominalReflectance [0.0]
[282] maximumNominalReflectance [0.0]
[283] radiometricStability [description of the radiometric stability of the target]
[284] cleanness [description of the cleanness of the target]
[285] absoluteAccuracy [0.0]
[e] Backwards
260
Expected type: Int
```

Abbildung 23 Der zulässige Datentyp für den ausgewählten Parameter, Quelle: eigene Bearbeitung

```
Currently it is in: [root->CA_2DReflectanceTarget]
[255] calibrationType [laboratory]
[256] radiometricCalibrationDate [1-09-2015 12:00:00]
[257] lampType [type of illumination used]
[258] atmosphericConditionCA_RadiometryInFlight [state of the atmosphere]
[259] aerosolQuantity [0.0]
[260] numberPoints [0]
[261] controlPointCA_RadiometryTestRange [0.0]
[262] expanse [0.0]
[263] minimumElevationCA_RadiometryTestRange [0.0]
[264] maximumElevationCA_RadiometryTestRange [0.0]
[265] averageElevationCA_RadiometryTestRange [0.0]
[266] linearSize [0.0]
[267] targetExpanse [0.0]
[268] shapeCA_2DReflectanceTarget [square]
[269] material [awning]
[270] spectralCharacteristicsCA_2DReflectanceTarget [Expand...]
[275] measuredReflectance [Expand...]
[281] minimumNominalReflectance [0.0]
[282] maximumNominalReflectance [0.0]
[283] radiometricStability [description of the radiometric stability of the target]
[284] cleanness [description of the cleanness of the target]
[285] absoluteAccuracy [0.0]
[e] Backwards
255
Possible values:
laboratory
testRange
inSitu
inFlight
vicarious
cross
other
```

Abbildung 24 Die Liste der möglichen Werte für den ausgewählten Parameter, Quelle: eigene Bearbeitung

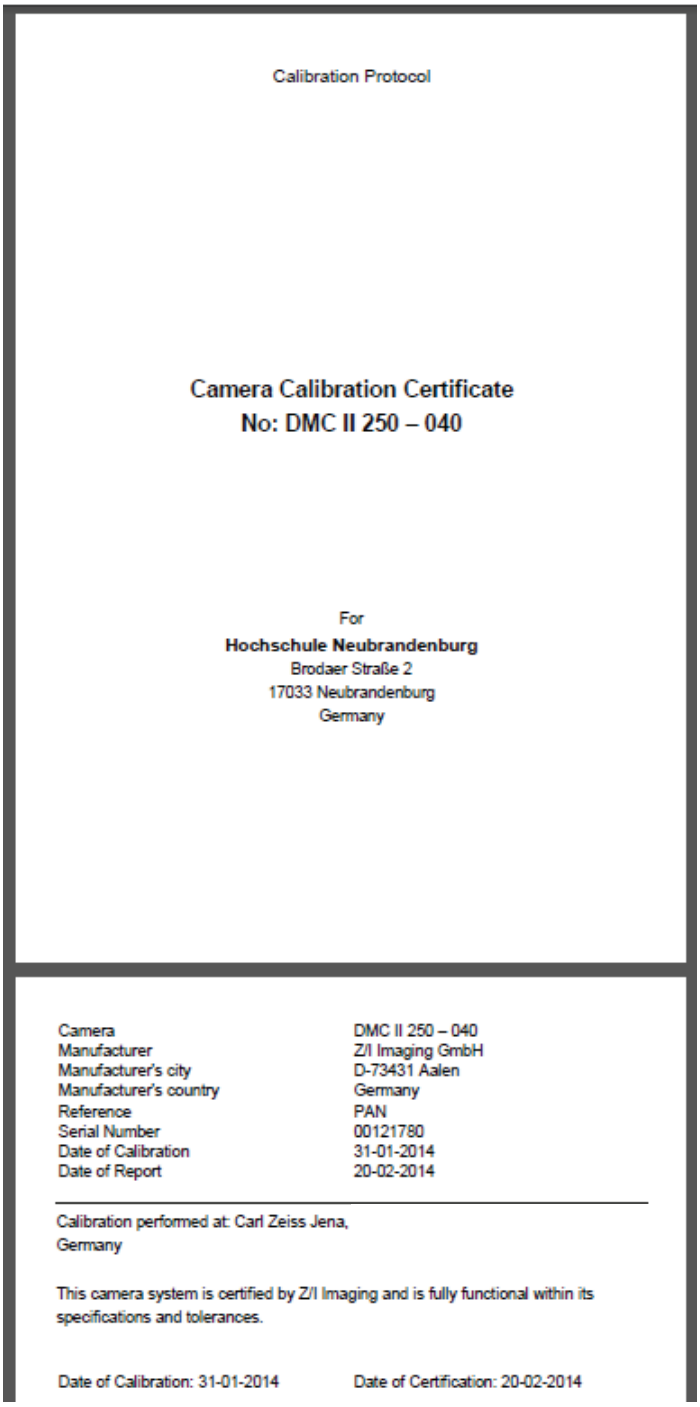
```
Currently it is in: [root->CA_2DReflectanceTarget]
[255] calibrationType [inSitu]
[256] radiometricCalibrationDate [1-09-2015 12:00:00]
[257] lampType [type of illumination used]
[258] atmosphericConditionCA_RadiometryInFlight [state of the atmosphere]
[259] aerosolQuantity [0.0]
[260] numberPoints [26]
[261] controlPointCA_RadiometryTestRange [0.0]
[262] expanse [0.0]
[263] minimumElevationCA_RadiometryTestRange [0.0]
[264] maximumElevationCA_RadiometryTestRange [0.0]
[265] averageElevationCA_RadiometryTestRange [0.0]
[266] linearSize [0.0]
[267] targetExpanse [0.0]
[268] shapeCA_2DReflectanceTarget [square]
[269] material [awning]
[270] spectralCharacteristicsCA_2DReflectanceTarget [Expand...]
[275] measuredReflectance [Expand...]
[281] minimumNominalReflectance [0.0]
[282] maximumNominalReflectance [0.0]
[283] radiometricStability [description of the radiometric stability of the target]
[284] cleanness [description of the cleanness of the target]
[285] absoluteAccuracy [0.0]
[e] Backwards
```

Abbildung 25 Die hinzugefügte Werte, Quelle: eigene Bearbeitung

Dem Benutzer wird auch seine aktuelle Position und die Taste *Backwards* angezeigt. Die Rückwärtstaste ermöglicht die Rückkehr zu den obersten Knoten und endlich zum Hauptmenü. In dem Programm wurde auch die Situation berücksichtig, in der der Nutzer einen Wert eingibt, der widersprüchlich mit dem Datentyp oder keinen zulässigen Wert ist. In solchem Fall wird eine Fehlermeldung „Input value has improper type. Expected type: (…)“ dem Benutzer angezeigt.

4.1.3 Herstellung des Rapports

Nach der Eingabe der Werte für alle untersuchten Parameter bietet das Softwareprogramm die Möglichkeit, ein Kalibrierprotokoll zu erstellen. Die Taste *Generate a report* ist im Hauptmenü zugänglich. Ein Ausschnitt aus dem Kalibrierprotokoll ist in Abbildung 26 zu sehen.



Calibration Protocol

Camera Calibration Certificate
No: DMC II 250 – 040

For
Hochschule Neubrandenburg
Brodaer Straße 2
17033 Neubrandenburg
Germany

Camera	DMC II 250 – 040
Manufacturer	Z/I Imaging GmbH
Manufacturer's city	D-73431 Aalen
Manufacturer's country	Germany
Reference	PAN
Serial Number	00121780
Date of Calibration	31-01-2014
Date of Report	20-02-2014

Calibration performed at: Carl Zeiss Jena,
Germany

This camera system is certified by Z/I Imaging and is fully functional within its specifications and tolerances.

Date of Calibration: 31-01-2014 Date of Certification: 20-02-2014

Abbildung 26 Ein Ausschnitt aus dem Kalibrierprotokoll, Quelle: eigene Bearbeitung

4.2 Testnutzung

Um das Funktionieren des fertigen Softwareprodukts zu prüfen, wurde die endgültige Testnutzung durchgeführt. Diese Prüfung basierte auf dem in der Praxis verwendeten Kalibrierprotokoll, der zur Verfügung von der Firma ZI-Imaging gestellt wurde. Während dieses Tests wurden die Werte für alle Parameter, die den

Inhalt des in der Praxis verwendeten Kalibrierprotokolls bilden, in das Softwareprogramm eingegeben. Diese Werte betrafen sowohl die Parameter der ISO-Norm als auch die nichtgenormten Parameter. Bei der Testnutzung wurden die Parameter mit allen Datentypen verwendet. Für bestimmte Parameter wurden die Werte aus der Liste mit den verfügbaren Optionen gewählt. Für die anderen Komponenten des Kalibrierprotokolls, die unendlich viele Werte annehmen können, wurden in das Softwareprogramm mehrere Werte eingegeben. Schließlich wurde das Kalibrierprotokoll mit den bei der Testnutzung eingetippten Werten erstellt. Im Anhang E ist das erstellte Kalibrierprotokoll zu sehen.

Der erstellte Rapport wurde danach mit dem in der Praxis verwendeten Kalibrierprotokoll verglichen. Das erstellte Kalibrierprotokoll beinhaltet alle Überschriften, Parameternamen und Werte aus dem Musterrapport. Die Textformatierung des erstellten Rapports entsprach in hohem Maße dem Musterrapport. Der Unterschied zwischen den Rapporten betrifft das Auftreten der Diagramme, der Ausschnitte aus den fachkundigen Softwareprogrammen und den anderen Abbildungen. In dem erstellten Kalibrierprotokoll sind diese grafischen Darstellungen nicht zu finden. Stattdessen sind die entsprechenden Parameternamen und ihre Werte platziert. Das Vorkommen dieser Tabellen erweitert das erstellte Kalibrierprotokoll um die zusätzlichen Seiten, deshalb seine Seitennummerierung kann sich mit dem in der Praxis verwendeten Kalibrierprotokoll nicht decken.

Die durchgeführte Testnutzung bewies das fehlerfreie Funktionieren des fertigen Softwareprogramms.

5. Zusammenfassung

Das Resultat der Masterarbeit ist die Umsetzung der Norm ISO/TS 19159-1 “Calibration and validation of remote sensing imagery sensors“ in Form eines Softwareprogramms. Das erstellte Softwareprodukt ermöglicht die Eingabe der Parameterwerte, die während des Kalibrierungsprozesses erworben werden, und die Erlangung der eingetippten Werte als ein Kalibrierprotokoll.

In dieser Arbeit wurde die Entstehung des Softwareprogramms von den Vorarbeiten über die Implementierung bis hin zur der Testnutzung schrittweise erläutert. Anfangs wurde der grundlegende Begriff dieser Arbeit erklärt sowie die Internationale Organisation für Normung, ihre Struktur und Normenreihe ISO 191xx beschrieben. In der Entwicklungsphase wurde die inhaltliche Analyse der Norm ISO/TS 19159-1 durchgeführt, in der auch die UML-Klassendiagramme und die Bezugnahme auf andere Texte berücksichtigt wurden. Weiterhin wurden die folgenden fachkundigen Softwareprogramme Altova XMLSpy, Java SE Development Kit 8 (Update 45) und Eclipse IDE for Eclipse Committers 4.4.2 charakterisiert, die bei der Bearbeitung der weiteren Arbeitsabschnitte erforderlich waren.

Außerhalb des Rahmens dieser Masterarbeit wurde aus den UML-Klassendiagrammen der ISO-Norm ein XML Schema abgeleitet, das die Grundlage der weiteren Arbeitsentwicklung war. Als die nächste Bearbeitungsphase des Themas wurde dieses XML Schema analysiert. Wegen des Umfangs dieses Dokuments wurde es nur teilweise schriftlich bearbeitet. Nachfolgend wurde auf der Basis von dem XML Schema ein wesentlicher Bestandteil dieser Arbeit — die XML-Datei ausgearbeitet. Sowohl ihre Erstellungs- als auch Validierungsweise wurde dokumentiert. Um ein Konzept des Endprodukts vom Softwareprogramm auszuarbeiten, wurde ein in der Praxis verwendetes Kalibrierprotokoll analysiert. Der Inhalt dieses Kalibrierprotokolls wurde mit der ISO-Norm verglichen. Den Elementen des Kalibrierprotokolls wurden die entsprechenden Parameter aus der ISO-Norm zugewiesen. Die Komponenten, die keinem Parameter aus der Norm zugeordnet werden konnten, wurden in einer getrennten XML-Datei gespeichert.

Weiterhin wurden die während der Bearbeitungsphasen des Themas aufgetretenen Probleme beschrieben, die sich auf verschiedenen Ebenen bezogen.

Das Vorkommen der in dieser Masterarbeit beschriebenen Schwierigkeiten verdeutlichte, dass die ISO/TS 19159-1 den theoretischen Ablauf des Kalibrierprozesses betraf. Diese Norm deckt die tatsächlichen Bedürfnisse des Kalibrierprozesses von optischen Sensoren nicht vollständig ab. Um diese Norm an die praktische Anwendbarkeit anzupassen, wurden die Lösungen für die Schwierigkeiten eingeführt, die diese Norm erweitern. Manche Änderungen beziehen sich auf den allgemeinen Kalibrierungsablauf, deshalb sollen sie zwecks der Vermeidung der redundanten Elemente in der Normenreihe 19159 bei der Erweiterung der anderen Normen wie z. B. ISO/TS 19130 berücksichtigt werden.

Als Vorstufe zur Erstellung des Programms wurde der Entwurf des Algorithmus ausgearbeitet. Ihre Struktur und Vorgehensweise wurde auch mit Hilfe von dem Programmablaufplan aufgezeigt. Dieser Entwurf wurde in der Programmiersprache Java implementiert. Der Quellcode des Programms wurde in der Arbeit ausführlich erläutert. Das Funktionieren des Softwareprogramms wurde auch aus der Sicht eines Benutzers erklärt. Abschließend wurde die endgültige Testnutzung des Softwareprodukts durchgeführt. Die Prüfung bewies das fehlerfreie Funktionieren des fertigen Softwareprogramms.

Bei der Bearbeitung des Softwareprogramms wurde Wert darauf gelegt, dass die Aufgabestellung möglichst generisch gelöst wird, um den Ansatz bei der Umsetzung der anderen Normen verwenden zu können. Das im Rahmen dieser Masterarbeit erstellte Softwareprodukt kann nach der Einführung der einzelnen Veränderungen auf weitere Normen übertragen werden. Diese Umwandlungen betreffen die Stellen, die eine bestimmte Norm charakterisieren. Der Hauptpunkt der Veränderungen ist die XML-Datei *Input*, deren Gestalt und Inhalt bezüglich der entsprechenden Norm annehmen wird. Die geänderte XML-Datei *Input* soll in die Quellcodedatei *FileContents.java* eingeführt werden. Mit der XML-Datei *Input* ist das Dokument *Types* mit den Datentypen der Parameter eng verbunden. Die Modifikation des Inhalts in der XML-Datei *Input* zwingt zu den Umbildungen in der XML-Datei *Types*, in dieser Art und Weise, dass jedem neuen Parameter einen entsprechenden Datentyp zugeordnet wird. Die XML-Datei *Others* mit den nichtgenormten Parametern soll auch an die auftretende Situation angepasst werden. Bei diesen Änderungen soll berücksichtigt werden, dass das

Softwareprogramm die gleichen Parameterbezeichnungen wie eine Größe behandelt.

Um das erstellte Softwareprogramm auf weitere Normen übertragen zu können, müssen die Änderungen in dem Quellcode folgen. In der Quellcodedatei *Programm.java* in der Zeile 566 bei *getElementsByTagName* soll der Name des Wurzelknotens aus der XML-Datei *Input* eingegeben werden. In dem Quellcodedokument *RaportGenerator.java* sollen die bestimmten Parametereigenschaften ergänzt werden. In der Methode *manualInitialization()* wurden die Listen für die Parameter mit unendlich vielen Werten und mit den in der Norm definierten Werten definiert.

Alle Veränderungen sollen nur den Austausch der Daten, nicht die Umbildungen der Dateien oder Quellcodestruktur betreffen. Mit Ausnahme der Änderung in der Textformatierung des Kalibrierprotokolls. Falls die Erarbeitung eines Kalibrierprotokolls nach dem Eigenbedarf erforderlich ist, sind die Umgestaltungen in dem Quellcode der Datei *PageGenerator.java* notwendig.

Das implementierte Softwareprodukt kann auch eine Grundlage für weitere Arbeiten liefern. Die Entwicklung kann vor allem das Erstellen der grafischen Benutzeroberfläche betreffen. Außerhalb der ästhetischen Gründe wird auch die Bedienung des Softwareprogramms erleichtert. Bei dem Verbesserungsprozess könnte die Suchfunktion der Parameter berücksichtigt werden. Das implementierte Softwareprodukt könnte um die weitere Darstellungsform der hinzugefügten Werte erweitert werden. Außer dem Kalibrierprotokoll könnten die Ergebnisse der Kalibrierung in Form von der XML-Datei gespeichert werden.

Abkürzungsverzeichnis

AHG	Ad Hoc Group
DCM	Digital Modular Camera
DIN	Deutsches Institut für Normung
DIS	Draft International Standard
FDIS	Final Draft International Standard
GNSS	Global Navigation Satellite System
IDE	Integrated Development Environment
IEC	International Electrotechnical Commission
IMU	Inertial Measurement Unit
ISA	International Federation of National Standardizing Associations
ISO	International Organisation for Standardization
ITU	International Telecommunication Union
NWIP	New Work Item Proposal
PMG	Programme maintenance group
PT	Project Team
RMSE	root mean square error
SC	Subcommittees
TC	Technical Committees
TC 211	Technical Committee 211 Geographic information/ Geomatics
UML	Unified Modeling Language
UNSCC	United Nations Standards Coordinating Committee
W3C	World Wide Web Consortium
WD	working draft
WG	Working Group
WSC	World Standards Cooperation
XML	Extensible Markup Language

Literaturverzeichnis

[1] Wolfgang Kresse, Lehrmaterialien zum Modul Geoinfrastruktur, Normen und Standards

[2] Wolfgang Kresse, Kian Fadaie, *ISO Standards for Geographic Information*, Springer- Verlag Berlin Heidelberg, 2004

[3] *Technical Specification ISO/TS 19159-1 Geographic information — Calibration and validation of remote sensing imagery sensors and data —Part 1: Optical sensors,* ISO, 2014

[4] Martin Fowler, *UML konzentriert: eine kompakte Einführung in die Standard-Objektmodellierungssprache*, Addison Wesley Verlag, 2004

[5] Bernd Oestereich, *Analyse und Design mit UML 2.3: objektorientierte Softwareentwicklung,* Oldenbourg Wissenschaftsverlag, 2009

[6] *International Standard ISO/FDIS 19115 Geographic information — Metadata,* ISO, 2002

[7] *International Standard ISO/FDIS 19115 Geographic information — Metadata—Part 2: Extensions for imagery and gridded data,* ISO, 2009

[8] *Technical Specification ISO/TS 19130 Geographic information — Imagery sensor models for geopositioning,* ISO, 2009

[9] *International Standard ISO/CD 19157 Geographic information — Data quality*, ISO, 2011

[10] Hans-Peter Habelitz, *Programmieren lernen mit Java*, Galileo Press, 2014

[11] Elliote Rusty Harold, W. Scott Means. Dt. Harold, Elliotte Rusty, *XML in a nutshell*, O'Reilly Verlag, 2003

[12] Helmut Vonhoegen, *Einstieg in XML*, Galileo Press, 2004

[13] XML Schema für die ISO-Norm 19159

[14] Marco Skulschus, Marcus Wiederstein, *XML: Standards und Technologien*, Camelio Medien, 2012

[15] Carl Zeiss Jena, *Calibration Protocol DMC II 250-040*, Jena, 2014

[16] Dietmar Ratz, Jens Scheffler, Detlef Seese, Jan Wiesenberger, *Grundkurs Programmieren in Java 8*, Carl Hanser Verlag München, 2014

[17] Mark Wutka, *J2EE Developer's Guide. JSP, Servlets, EJB 2.0, JNDI, JMS, JDBC, Corba, XML, RMI*, Markt Technik Verlag, 2001

Internetquellen

[IQ1] DIN: Was ist eine internationale Norm? Unter der URL http://www.sr.din.de/cmd?level=tpl-rubrik&menuid=130854&cmsareaid=130854&cmsrubid=131889&menurubricid=131889&languageid=de erreichbar [Stand 15.4.2015]

[IQ2] Wikipedia, Die freie Enzyklopädie: Internationale Organisation für Normung. Unter der URL http://de.wikipedia.org/wiki/Internationale_Organisation_f%C3%BCr_Normung#Prozess erreichbar [Stand 22.4.2015]

[IQ3] ISO members. Unter der URL http://www.iso.org/iso/about/iso_members.htm erreichbar [Stand 20.9.2015]

[IQ4] ISO/TC 211 Geographic information/ Geomatics. Unter der URL http://www.iso.org/iso/iso_technical_committee?commid=54904 erreichbar [Stand 20.9.2015]

[IQ5] Wolfgang Kresse, *ISO-Normen für Photogrammetrie und Fernerkundung – aktueller Status*, 2014. Unter der URL http://www.dgpf.de/neu/Proc2014/proceedings/papers/Beitrag171.pdf erreichbar [Stand 24.4.2015]

[IQ6] Standards catalogue: ISO/TC 211 - Geographic information/Geomatics. Unter der URL http://www.iso.org/iso/home/store/catalogue_tc/catalogue_tc_browse.htm?commid=54904 erreichbar [Stand 26.4.2015]

[IQ7] Altova, XMLSpy/ XML Editor. Unter der URL: http://www.altova.com/xmlspy.html erreichbar [Stand 02.5.2015]

[IQ8] Java SE Development Kit 8. Unter der URL: http://www.oracle.com/technetwork/java/javase/downloads/jdk8-downloads-2133151.html erreichbar [Stand 02.5.2015]

[IQ9] Eclipse. Unter der URL: https://eclipse.org/ erreichbar [Stand 03.5.2015]

[IQ10] ShapeChange. Unter der URL: http://shapechange.net/about/ erreichbar [Stand 13.5.2015]

[IQ11] XML Encoding. Unter der URL: http://www.w3schools.com/xml/xml_encoding.asp erreichbar [Stand 19.5.2015]

[IQ12] XSD - The <schema> Element. Unter der URL http://www.w3schools.com/schema/schema_schema.asp erreichbar [Stand 25.5.2015]

[IQ13] Altova XMLSpy Tutorial. Unter der URL http://www.altova.com/de/documents/XMLSpyTutorial.pdf erreichbar [Stand 01.6.2015]

[IQ14] Intergraph, *Product Sheet. DMC II 250 Camera System*, 2010. Unter der URL http://www.getmap.gr/v2/site/images/stories/dmcii250.pdf erreichbar [Stand 08.6.2015]

[IQ15]Mozilla Developer Network. Node.childNodes. Unter der URL
https://developer.mozilla.org/de/docs/Web/API/Node/childNodes
erreichbar [Stand 20.7.2015]

Abbildungsverzeichnis

Abbildung 1 Schema der ISO/TS 19159, Quelle: [3, S. 12] 15
Abbildung 2 Schema der ISO/TS 19159-1, Quelle: [3, S. 12] 15
Abbildung 3 Tabellarische Beschreibung der einzelnen Klassen und Attributen, Quelle: [3, S. 55] 17
Abbildung 4 *CA_OpticalSensors* als UML-Klassendiagramm, Quelle: [3, S. 16] 18
Abbildung 5 Das Altova XMLSpy-Logo, Quelle: [IQ7] 20
Abbildung 6 Das Java- Logo, Quelle: [IQ8] 20
Abbildung 7 Das Eclipse-Logo, Quelle: [IQ9] 20
Abbildung 8 Ein Ausschnitt aus dem XML Schema für die ISO/TS-Norm 19159, Quelle: [13] 22
Abbildung 9 Ein Meldefenster bei der Wohlgeformtheitsprüfung, Quelle: eigene Bearbeitung 23
Abbildung 10 Das XML- Dokument mit dem Wurzelelement *CA_2DReflectanceTarget* und den Musterwerten, Quelle: eigene Bearbeitung 24
Abbildung 11 Ein Dialogfeld “Neues Dokument anlegen“, Quelle: eigene Bearbeitung 25
Abbildung 12 Die XML-Datei mit dem Wurzelelement *CA_2DReflectanceTarget*, Quelle: eigene Bearbeitung 26
Abbildung 13 Ein Meldefenster mit dem Validierungsergebnis, Quelle: eigene Bearbeitung 27
Abbildung 14 Knotenstruktur von *CI_Citation,* Quelle: eigene Bearbeitung 30
Abbildung 15 UML-Klassendiagramm der Klasse *CA_InteriorOrientation,* Quelle: [3, S. 18] 34

Abbildung 16 Bearbeitungsweise der einzelnen Dateien, Quelle: eigene Bearbeitung 37
Abbildung 17 Programmablaufplan des Softwareproduktentwurfs, Quelle: eigene Bearbeitung 38
Abbildung 18 Der Einstiegspunkt in ein Java-Programm, Quelle: eigene Bearbeitung 40
Abbildung 19 ein Feld mit den Parameterdaten, Quelle: eigene Bearbeitung 43
Abbildung 20 import-Anweisungen in der Datei *PageGenerator.java*, Quelle: eigene Bearbeitung 46
Abbildung 21 Das Layout des Hauptmenüs, Quelle: eigene Bearbeitung 49
Abbildung 22 Wahl den Elternknoten, Quelle: eigene Bearbeitung 50
Abbildung 23 Der zulässige Datentyp für den ausgewählten Parameter, Quelle: eigene Bearbeitung 51
Abbildung 24 Die Liste der möglichen Werte für den ausgewählten Parameter, Quelle: eigene Bearbeitung 51
Abbildung 25 Die hinzugefügte Werte, Quelle: eigene Bearbeitung 52

Tabellenverzeichnis

Tabelle 1 das Arbeitsfeld der entsprechenden Subkomitees oder Working Groups, Quelle: [IQ4]
Tabelle 2 Meilensteine der Masterarbeit, Quelle: eigene Bearbeitung
Tabelle 3 Beispiel von Produkt-Levels, Quelle: eigene Bearbeitung auf Basis von [3, S.49]
Tabelle 5 Aufstellung der außerhalb der ISO/TS 19159-1 definierten Datentypen, Quelle: eigene Bearbeitung anhand [6, S. 49, 71, 89, 90], [7, S. 35], [8, S. 82], [9, S. 49-50]
Tabelle 6 Aufstellung der außerhalb der ISO/TS 19159-1 definierten Datentypen, Quelle: eigene Bearbeitung anhand [7, S. 49, 71, 89, 90], [8, S. 35], [9, S. 82], [10, S. 49-50]

Anhang A

Die XML-Datei mit den genormten Parametern (*Input)*

Anhang B

Die XML-Datei mit den nichtgenormten Parametern (*Others)*

Anhang C

XML-Datei mit den Datentypen von den Parametern (*Types*)

Anhang D

Die Quelltextdateien des Softwareprogramms:

- *RaportGenerator.java*
- *Program.java*
- *Parameter.java*
- *ParameterType.java*
- *Pair.java*
- *PageGenerator.java*
- *FileContents.java*

Anhang E

Das während der endgültigen Testnutzung erstellte Kalibrierprotokoll (*Report*)

Alle Anhänge befinden sich auf einer Daten-CD, die dieser Masterarbeit beigefügt wird.

Anhang A
Die XML-Datei mit den genormten Parametern (Input)

```
<?xml version="1.0" encoding="UTF-8"?>
<Norm xmlns="http://example.com/ISO19159-1"
                        xmlns:gml="http://www.opengis.net/gml/3.2"
                        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
                        xsi:schemaLocation="http://example.com/ISO19159-1 ISO19159-1.xsd"
                        gml:id="GML_7b1a5a6f-ddad-4c3d-a507-3eb9ee0a8e68">
    <CA_2DReflectanceTarget>
        <calibrationType>laboratory</calibrationType>
        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
        <lampType>type of illumination used</lampType>
        <atmosphericConditionCA_RadiometryInFlight>state of the
        atmosphere</atmosphericConditionCA_RadiometryInFlight>
        <aerosolQuantity>0.0</aerosolQuantity>
        <numberPoints>0</numberPoints>
        <controlPointCA_RadiometryTestRange>0.0</controlPointCA_RadiometryTestRange>
        <expanse uom="#m">0.0</expanse>
        <minimumElevationCA_RadiometryTestRange
        uom="#m">0.0</minimumElevationCA_RadiometryTestRange>
        <maximumElevationCA_RadiometryTestRange
        uom="#m">0.0</maximumElevationCA_RadiometryTestRange>
        <averageElevationCA_RadiometryTestRange
        uom="#m">0.0</averageElevationCA_RadiometryTestRange>
        <linearSize uom="#m">0.0</linearSize>
        <targetExpanse uom="#m">0.0</targetExpanse>
        <shapeCA_2DReflectanceTarget>square</shapeCA_2DReflectanceTarget>
        <material>awning</material>
        <spectralCharacteristicsCA_2DReflectanceTarget>
            <CA_SpectrumCA_2DReflectanceTarget>
                <numberBandsCA_2DReflectanceTarget>0</numberBandsCA_2DReflectanceTarget>
                <wavelengthCA_SpectrumCA_2DReflectanceTarget
                uom="#m">0.0</wavelengthCA_SpectrumCA_2DReflectanceTarget>
                <responseCA_2DReflectanceTarget>0.0</responseCA_2DReflectanceTarget>
            </CA_SpectrumCA_2DReflectanceTarget>
        </spectralCharacteristicsCA_2DReflectanceTarget>
        <measuredReflectance>
            <CA_MeasuredReflectance>
                <intensity>0.0</intensity>
                <wavelengthCA_MeasuredReflectance
                uom="#m">0.0</wavelengthCA_MeasuredReflectance>
                <zenithAngle uom="#m">0.0</zenithAngle>
                <azimuth uom="#m">0.0</azimuth>
            </CA_MeasuredReflectance>
        </measuredReflectance>
        <minimumNominalReflectance>0.0</minimumNominalReflectance>
        <maximumNominalReflectance>0.0</maximumNominalReflectance>
        <radiometricStability>description of the radiometric stability of the
        target</radiometricStability>
        <cleanness>description of the cleanness of the target</cleanness>
        <absoluteAccuracy>0.0</absoluteAccuracy>
    </CA_2DReflectanceTarget>
    <CA_AffineDistortion>
        <a1>0.0</a1>
        <a2>0.0</a2>
    </CA_AffineDistortion>
    <CA_AffineFraserDistortion>
        <f1>0.0</f1>
        <f2>0.0</f2>
    </CA_AffineFraserDistortion>
    <CA_AirforcePattern>
        <calibrationType>laboratory</calibrationType>
        <sizeCA_AirforcePattern uom="#m">0.0</sizeCA_AirforcePattern>
        <descriptionCA_AirforcePattern>free text description of the
        target</descriptionCA_AirforcePattern>
        <typeCA_AirforcePattern>airforcePattern</typeCA_AirforcePattern>
```

```
        <materialCA_AirforcePattern>awning</materialCA_AirforcePattern>
        <paintTypeCA_AirforcePattern>characteristics of the
        paint</paintTypeCA_AirforcePattern>
        <reflectancePropertiesCA_AirforcePattern>peculiarity of the
        reflectance</reflectancePropertiesCA_AirforcePattern>
        <minimumBarWidth uom="#m">0.0</minimumBarWidth>
        <maximumBarWidth uom="#m">0.0</maximumBarWidth>
        <numberOfBarsInBox>1</numberOfBarsInBox>
        <numberOfBoxes>1</numberOfBoxes>
    </CA_AirforcePattern>
    <CA_AuxiliaryDevice>
        <calibrationType>laboratory</calibrationType>
        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>
        <geometryCalibrationType>more detailed explanation of the the calibration
        type</geometryCalibrationType>
        <synchronizationCA_AuxiliaryDevice>0-0-0 00:00:00</synchronizationCA_AuxiliaryDevice>
        <synchronizationErrorCA_AuxiliaryDevice>0-0-0
        00:00:00</synchronizationErrorCA_AuxiliaryDevice>
        <referenceTemperatureCA_AuxiliaryDevice>
            <CA_TemperatureCA_AuxiliaryDevice>
                <temperatureCA_AuxiliaryDevice>0.0</temperatureCA_AuxiliaryDevice>
            </CA_TemperatureCA_AuxiliaryDevice>
        </referenceTemperatureCA_AuxiliaryDevice>
        <versionFirmwareCA_AuxiliaryDevice>note about the firmware
        version</versionFirmwareCA_AuxiliaryDevice>
        <versionHardwareCA_AuxiliaryDevice>note about the hardware
        version</versionHardwareCA_AuxiliaryDevice>
        <timeLeverarmCA_AuxiliaryDevice>0-0-0 00:00:00</timeLeverarmCA_AuxiliaryDevice>
        <leverarmCA_AuxiliaryDevice>0.0</leverarmCA_AuxiliaryDevice>
        <errorLeverarmCA_AuxiliaryDevice uom="#m">0.0</errorLeverarmCA_AuxiliaryDevice>
    </CA_AuxiliaryDevice>
    <CA_CalibrationValidation>
        <calibrationType>laboratory</calibrationType>
    </CA_CalibrationValidation>
    <CA_DecenteringDistortion>
        <p1>0.0</p1>
        <p2>0.0</p2>
    </CA_DecenteringDistortion>
    <CA_DefectPixels>
        <row>0</row>
        <column>0</column>
    </CA_DefectPixels>
    <CA_Detector>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
                        <alternateTitleCA_RadiometryInSensor>short name or other language
                        name by which the cited information is
                        known</alternateTitleCA_RadiometryInSensor>
                        <dateCA_RadiometryInSensor>
                            <CI_DateCA_RadiometryInSensor>

                                <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                                diometryInSensor>
```

```
            <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
            InSensor>
        </CI_DateCA_RadiometryInSensor>
    </dateCA_RadiometryInSensor>
    <editionCA_RadiometryInSensor>version of the cited
    resource</editionCA_RadiometryInSensor>
    <editionDateCA_RadiometryInSensor>

        <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
        A_RadiometryInSensor>
    </editionDateCA_RadiometryInSensor>
    <identifierCA_RadiometryInSensor>
        <MD_IdentifierCA_RadiometryInSensor>
            <authorityCA_RadiometryInSensor>person or party responsible
            for maintenance of the
            namespace</authorityCA_RadiometryInSensor>
            <codeCA_RadiometryInSensor>alphanumeric value identifying an
            instance in the namespace</codeCA_RadiometryInSensor>
        </MD_IdentifierCA_RadiometryInSensor>
    </identifierCA_RadiometryInSensor>
    <citedResponsiblePartyCA_RadiometryInSensor>
        <CI_ResponsiblePartyCA_RadiometryInSensor>
            <individualNameCA_RadiometryInSensor>name of the responsible
            person- surname,given name, title separated by a
            delimiter</individualNameCA_RadiometryInSensor>
            <organisationNameCA_RadiometryInSensor>name of the
            responsible
            organization</organisationNameCA_RadiometryInSensor>
            <positionNameCA_RadiometryInSensor>role or position of the
            responsible person</positionNameCA_RadiometryInSensor>
            <contactInfoCA_RadiometryInSensor>
                <CI_ContactCA_RadiometryInSensor>
                    <phoneCA_RadiometryInSensor>
                        <CI_TelephoneCA_RadiometryInSensor>
                            <voiceCA_RadiometryInSensor>telephone number
                            by which individuals can speak to the
                            responsible organization or
                            individual</voiceCA_RadiometryInSensor>
                            <facsimileCA_RadiometryInSensor>telephone
                            number of a facsimile machine for the
                            responsible organization or
                            individual</facsimileCA_RadiometryInSensor>
                        </CI_TelephoneCA_RadiometryInSensor>
                    </phoneCA_RadiometryInSensor>
                    <addressCA_RadiometryInSensor>
                        <CI_AddressCA_RadiometryInSensor>
                            <deliveryPointCA_RadiometryInSensor>address
                            line for the
                            location</deliveryPointCA_RadiometryInSensor>
                            <cityCA_RadiometryInSensor>city of the
                            location</cityCA_RadiometryInSensor>

                            <administrativeAreaCA_RadiometryInSensor>state
                            , province of the
                            location</administrativeAreaCA_RadiometryInSen
                            sor>
                            <postalCodeCA_RadiometryInSensor>ZIP or
                            other postal
                            code</postalCodeCA_RadiometryInSensor>
                            <countryCA_RadiometryInSensor>country of the
                            physical
                            address</countryCA_RadiometryInSensor>

                            <electronicMailAddressCA_RadiometryInSensor>te
                            lephone number of a facsimile machine for
                            the responsible organization or
```

```
                                    individual</electronicMailAddressCA_RadiometryInSensor>
                                </CI_AddressCA_RadiometryInSensor>
                            </addressCA_RadiometryInSensor>
                            <onlineResourceCA_RadiometryInSensor>
                                <CI_OnlineResourceCA_RadiometryInSensor>
                                    <linkageCA_RadiometryInSensor>location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme</linkageCA_RadiometryInSensor>
                                    <protocolCA_RadiometryInSensor>connection protocol to be used</protocolCA_RadiometryInSensor>

                                    <applicationProfileCA_RadiometryInSensor>name of an application profile that can be used with the online resource</applicationProfileCA_RadiometryInSensor>

                                    <nameCI_OnlineResourceCA_RadiometryInSensor>name of the online resource</nameCI_OnlineResourceCA_RadiometryInSensor>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>

                                    <functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>
                                </CI_OnlineResourceCA_RadiometryInSensor>
                            </onlineResourceCA_RadiometryInSensor>
                            <hoursOfServiceCA_RadiometryInSensor>time period (including time zone) when individuals can contact the organization or individual</hoursOfServiceCA_RadiometryInSensor>

                            <contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to contact the individual or organization</contactInstructionsCA_RadiometryInSensor>
                        </CI_ContactCA_RadiometryInSensor>
                    </contactInfoCA_RadiometryInSensor>

                    <roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>
                </CI_ResponsiblePartyCA_RadiometryInSensor>
            </citedResponsiblePartyCA_RadiometryInSensor>

            <presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
            <seriesCA_RadiometryInSensor>
                <CI_SeriesCA_RadiometryInSensor>
                    <nameCI_SeriesCA_RadiometryInSensor>name of the series, or aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>
                    <issueIdentificationCA_RadiometryInSensor>information identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>
                    <pageCA_RadiometryInSensor>details on which pages of the publication the article was published</pageCA_RadiometryInSensor>
```

```
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_RadiometryInSensor
                                1>
                            </CI_AddressCA_RadiometryInSensor1>
                        </addressCA_RadiometryInSensor1>
                        <onlineResourceCA_RadiometryInSensor1>
                            <CI_OnlineResourceCA_RadiometryInSensor1>
                                <linkageCA_RadiometryInSensor1>location (address)
                                for on-line access using a Uniform Resource Locator
```

```
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <detectorIdentification>
        <MD_IdentificationCA_Detector>
            <citationCA_Detector>
                <CI_CitationCA_Detector>
                    <titleCA_Detector>name by which the cited resource is
                    known</titleCA_Detector>
                    <alternateTitleCA_Detector>short name or other language name by
                    which the cited information is known</alternateTitleCA_Detector>
                    <dateCA_Detector>
                        <CI_DateCA_Detector>
                            <dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>
                            <dateTypeCA_Detector>creation</dateTypeCA_Detector>
                        </CI_DateCA_Detector>
                    </dateCA_Detector>
                    <editionCA_Detector>version of the cited resource</editionCA_Detector>
                    <editionDateCA_Detector>
                        <dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>
                    </editionDateCA_Detector>
                    <identifierCA_Detector>
                        <MD_IdentifierCA_Detector>
                            <authorityCA_Detector>person or party responsible for
                            maintenance of the namespace</authorityCA_Detector>
                            <codeCA_Detector>alphanumeric value identifying an instance
                            in the namespace</codeCA_Detector>
                        </MD_IdentifierCA_Detector>
                    </identifierCA_Detector>
                    <citedResponsiblePartyCA_Detector>
                        <CI_ResponsiblePartyCA_Detector>
                            <individualNameCA_Detector>name of the responsible person-
                            surname,given name, title separated by a
                            delimiter</individualNameCA_Detector>
```

```
<organisationNameCA_Detector>name of the responsible
organization</organisationNameCA_Detector>
<positionNameCA_Detector>role or position of the responsible
person</positionNameCA_Detector>
<contactInfoCA_Detector>
    <CI_ContactCA_Detector>
        <phoneCA_Detector>
            <CI_TelephoneCA_Detector>
                <voiceCA_Detector>telephone number by which
                individuals can speak to the responsible
                organization or individual</voiceCA_Detector>
                <facsimileCA_Detector>telephone number of a
                facsimile machine for the responsible
                organization or
                individual</facsimileCA_Detector>
            </CI_TelephoneCA_Detector>
        </phoneCA_Detector>
        <addressCA_Detector>
            <CI_AddressCA_Detector>
                <deliveryPointCA_Detector>address line for
                the location</deliveryPointCA_Detector>
                <cityCA_Detector>city of the
                location</cityCA_Detector>
                <administrativeAreaCA_Detector>state,
                province of the
                location</administrativeAreaCA_Detector>
                <postalCodeCA_Detector>ZIP or other postal
                code</postalCodeCA_Detector>
                <countryCA_Detector>country of the physical
                address</countryCA_Detector>
                <electronicMailAddressCA_Detector>telephone
                number of a facsimile machine for the
                responsible organization or
                individual</electronicMailAddressCA_Detector>
            </CI_AddressCA_Detector>
        </addressCA_Detector>
        <onlineResourceCA_Detector>
            <CI_OnlineResourceCA_Detector>
                <linkageCA_Detector>location (address) for
                on-line access using a Uniform Resource
                Locator address or similar addressing
                scheme</linkageCA_Detector>
                <protocolCA_Detector>connection protocol to
                be used</protocolCA_Detector>
                <applicationProfileCA_Detector>name of an
                application profile that can be used with
                the online
                resource</applicationProfileCA_Detector>
                <nameCI_OnlineResourceCA_Detector>name of
                the online
                resource</nameCI_OnlineResourceCA_Detector>

                <descriptionCI_OnlineResourceCA_Detector>detai
                led text description of what the online
                resource
                is/does</descriptionCI_OnlineResourceCA_Detect
                or>

                <functionCA_Detector>download</functionCA_Dete
                ctor>
            </CI_OnlineResourceCA_Detector>
        </onlineResourceCA_Detector>
        <hoursOfServiceCA_Detector>time period (including
        time zone) when individuals can contact the
        organization or individual</hoursOfServiceCA_Detector>
        <contactInstructionsCA_Detector>supplemental
        instructions on how or when to contact the
```

```
                                    individual or
                                    organization</contactInstructionsCA_Detector>
                                </CI_ContactCA_Detector>
                            </contactInfoCA_Detector>
                            <roleCA_Detector>resourceProvider</roleCA_Detector>
                        </CI_ResponsiblePartyCA_Detector>
                    </citedResponsiblePartyCA_Detector>

                    <presentationFormCA_Detector>documentDigital</presentationFormCA_Detec
                    tor>
                    <seriesCA_Detector>
                        <CI_SeriesCA_Detector>
                            <nameCI_SeriesCA_Detector>name of the series, or aggregate
                            dataset, of which the dataset is a
                            part</nameCI_SeriesCA_Detector>
                            <issueIdentificationCA_Detector>information identifying the
                            issue of the series</issueIdentificationCA_Detector>
                            <pageCA_Detector>details on which pages of the publication
                            the article was published</pageCA_Detector>
                        </CI_SeriesCA_Detector>
                    </seriesCA_Detector>
                    <otherCitationDetailsCA_Detector>other information required to
                    complete the citation that is not recorded
                    elsewhere</otherCitationDetailsCA_Detector>
                    <collectiveTitleCA_Detector>common title with holdings
                    note</collectiveTitleCA_Detector>
                    <ISBNCA_Detector>international Standard Book Number</ISBNCA_Detector>
                    <ISSNCA_Detector>international Standard Serial
                    Number</ISSNCA_Detector>
                </CI_CitationCA_Detector>
            </citationCA_Detector>
            <abstractCA_Detector>brief narrative summary of the content of the
            resource(s)</abstractCA_Detector>
            <purposeCA_Detector>summary of the intentions with which the resource(s) was
            developed</purposeCA_Detector>
            <creditCA_Detector>recognition of those who contributed to the
            resource(s)</creditCA_Detector>
            <statusCA_Detector>completed</statusCA_Detector>
            <pointOfContactCA_Detector>
                <CI_ResponsiblePartyCA_Detector1>
                    <individualNameCA_Detector1>name of the responsible person-
                    surname,given name, title separated by a
                    delimiter</individualNameCA_Detector1>
                    <organisationNameCA_Detector1>name of the responsible
                    organization</organisationNameCA_Detector1>
                    <positionNameCA_Detector1>role or position of the responsible
                    person</positionNameCA_Detector1>
                    <contactInfoCA_Detector1>
                        <CI_ContactCA_Detector1>
                            <phoneCA_Detector1>
                                <CI_TelephoneCA_Detector1>
                                    <voiceCA_Detector1>telephone number by which
                                    individuals can speak to the responsible
                                    organization or individual</voiceCA_Detector1>
                                    <facsimileCA_Detector1>telephone number of a
                                    facsimile machine for the responsible organization
                                    or individual</facsimileCA_Detector1>
                                </CI_TelephoneCA_Detector1>
                            </phoneCA_Detector1>
                            <addressCA_Detector1>
                                <CI_AddressCA_Detector1>
                                    <deliveryPointCA_Detector1>address line for the
                                    location</deliveryPointCA_Detector1>
                                    <cityCA_Detector1>city of the
                                    location</cityCA_Detector1>
                                    <administrativeAreaCA_Detector1>state, province of
                                    the location</administrativeAreaCA_Detector1>
```

```
                                    <postalCodeCA_Detector1>ZIP or other postal
                                    code</postalCodeCA_Detector1>
                                    <countryCA_Detector1>country of the physical
                                    address</countryCA_Detector1>
                                    <electronicMailAddressCA_Detector1>telephone number
                                    of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_Detector1>
                                </CI_AddressCA_Detector1>
                            </addressCA_Detector1>
                            <onlineResourceCA_Detector1>
                                <CI_OnlineResourceCA_Detector1>
                                    <linkageCA_Detector1>location (address) for on-line
                                    access using a Uniform Resource Locator address or
                                    similar addressing scheme</linkageCA_Detector1>
                                    <protocolCA_Detector1>connection protocol to be
                                    used</protocolCA_Detector1>
                                    <applicationProfileCA_Detector1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_Detector1>
                                    <nameCI_OnlineResourceCA_Detector1>name of the
                                    online resource</nameCI_OnlineResourceCA_Detector1>
                                    <descriptionCI_OnlineResourceCA_Detector1>detailed
                                    text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Detector1>
                                    <functionCA_Detector1>download</functionCA_Detector1>
                                </CI_OnlineResourceCA_Detector1>
                            </onlineResourceCA_Detector1>
                            <hoursOfServiceCA_Detector1>time period (including time
                            zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_Detector1>
                            <contactInstructionsCA_Detector1>supplemental instructions
                            on how or when to contact the individual or
                            organization</contactInstructionsCA_Detector1>
                        </CI_ContactCA_Detector1>
                    </contactInfoCA_Detector1>
                    <roleCA_Detector1>resourceProvider</roleCA_Detector1>
                </CI_ResponsiblePartyCA_Detector1>
            </pointOfContactCA_Detector>
        </MD_IdentificationCA_Detector>
    </detectorIdentification>
</CA_Detector>
<CA_DetectorDemands>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
    <maxWavelength>0.0</maxWavelength>
    <b>0.0</b>
    <c>0.0</c>
    <sensorSystemIdentification>
        <MD_IdentificationCA_RadiometryInSensor>
            <citationCA_RadiometryInSensor>
                <CI_CitationCA_RadiometryInSensor>
                    <titleCA_RadiometryInSensor>name by which the cited resource is
                    known</titleCA_RadiometryInSensor>
                    <alternateTitleCA_RadiometryInSensor>short name or other language
                    name by which the cited information is
                    known</alternateTitleCA_RadiometryInSensor>
                    <dateCA_RadiometryInSensor>
                        <CI_DateCA_RadiometryInSensor>

                            <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                            diometryInSensor>
```

```
                <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                InSensor>
            </CI_DateCA_RadiometryInSensor>
        </dateCA_RadiometryInSensor>
        <editionCA_RadiometryInSensor>version of the cited
        resource</editionCA_RadiometryInSensor>
        <editionDateCA_RadiometryInSensor>

            <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
            A_RadiometryInSensor>
        </editionDateCA_RadiometryInSensor>
        <identifierCA_RadiometryInSensor>
            <MD_IdentifierCA_RadiometryInSensor>
                <authorityCA_RadiometryInSensor>person or party responsible
                for maintenance of the
                namespace</authorityCA_RadiometryInSensor>
                <codeCA_RadiometryInSensor>alphanumeric value identifying an
                instance in the namespace</codeCA_RadiometryInSensor>
            </MD_IdentifierCA_RadiometryInSensor>
        </identifierCA_RadiometryInSensor>
        <citedResponsiblePartyCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor>
                <individualNameCA_RadiometryInSensor>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor>
                <organisationNameCA_RadiometryInSensor>name of the
                responsible
                organization</organisationNameCA_RadiometryInSensor>
                <positionNameCA_RadiometryInSensor>role or position of the
                responsible person</positionNameCA_RadiometryInSensor>
                <contactInfoCA_RadiometryInSensor>
                    <CI_ContactCA_RadiometryInSensor>
                        <phoneCA_RadiometryInSensor>
                            <CI_TelephoneCA_RadiometryInSensor>
                                <voiceCA_RadiometryInSensor>telephone number
                                by which individuals can speak to the
                                responsible organization or
                                individual</voiceCA_RadiometryInSensor>
                                <facsimileCA_RadiometryInSensor>telephone
                                number of a facsimile machine for the
                                responsible organization or
                                individual</facsimileCA_RadiometryInSensor>
                            </CI_TelephoneCA_RadiometryInSensor>
                        </phoneCA_RadiometryInSensor>
                        <addressCA_RadiometryInSensor>
                            <CI_AddressCA_RadiometryInSensor>
                                <deliveryPointCA_RadiometryInSensor>address
                                line for the
                                location</deliveryPointCA_RadiometryInSensor>
                                <cityCA_RadiometryInSensor>city of the
                                location</cityCA_RadiometryInSensor>

                                <administrativeAreaCA_RadiometryInSensor>state
                                , province of the
                                location</administrativeAreaCA_RadiometryInSen
                                sor>
                                <postalCodeCA_RadiometryInSensor>ZIP or
                                other postal
                                code</postalCodeCA_RadiometryInSensor>
                                <countryCA_RadiometryInSensor>country of the
                                physical
                                address</countryCA_RadiometryInSensor>

                                <electronicMailAddressCA_RadiometryInSensor>te
                                lephone number of a facsimile machine for
                                the responsible organization or
```

```
                                    individual</electronicMailAddressCA_RadiometryInSensor>
                                </CI_AddressCA_RadiometryInSensor>
                            </addressCA_RadiometryInSensor>
                            <onlineResourceCA_RadiometryInSensor>
                                <CI_OnlineResourceCA_RadiometryInSensor>
                                    <linkageCA_RadiometryInSensor>location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme</linkageCA_RadiometryInSensor>
                                    <protocolCA_RadiometryInSensor>connection protocol to be used</protocolCA_RadiometryInSensor>

                                    <applicationProfileCA_RadiometryInSensor>name of an application profile that can be used with the online resource</applicationProfileCA_RadiometryInSensor>

                                    <nameCI_OnlineResourceCA_RadiometryInSensor>name of the online resource</nameCI_OnlineResourceCA_RadiometryInSensor>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>

                                    <functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>
                                </CI_OnlineResourceCA_RadiometryInSensor>
                            </onlineResourceCA_RadiometryInSensor>
                            <hoursOfServiceCA_RadiometryInSensor>time period (including time zone) when individuals can contact the organization or individual</hoursOfServiceCA_RadiometryInSensor>

                            <contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to contact the individual or organization</contactInstructionsCA_RadiometryInSensor>
                        </CI_ContactCA_RadiometryInSensor>
                    </contactInfoCA_RadiometryInSensor>

                    <roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>
                </CI_ResponsiblePartyCA_RadiometryInSensor>
            </citedResponsiblePartyCA_RadiometryInSensor>

            <presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
            <seriesCA_RadiometryInSensor>
                <CI_SeriesCA_RadiometryInSensor>
                    <nameCI_SeriesCA_RadiometryInSensor>name of the series, or aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>
                    <issueIdentificationCA_RadiometryInSensor>information identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>
                    <pageCA_RadiometryInSensor>details on which pages of the publication the article was published</pageCA_RadiometryInSensor>
```

```
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_RadiometryInSensor
                                1>
                            </CI_AddressCA_RadiometryInSensor1>
                        </addressCA_RadiometryInSensor1>
                        <onlineResourceCA_RadiometryInSensor1>
                            <CI_OnlineResourceCA_RadiometryInSensor1>
                                <linkageCA_RadiometryInSensor1>location (address)
                                for on-line access using a Uniform Resource Locator
```

```
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <detectorIdentification>
        <MD_IdentificationCA_Detector>
            <citationCA_Detector>
                <CI_CitationCA_Detector>
                    <titleCA_Detector>name by which the cited resource is
                    known</titleCA_Detector>
                    <alternateTitleCA_Detector>short name or other language name by
                    which the cited information is known</alternateTitleCA_Detector>
                    <dateCA_Detector>
                        <CI_DateCA_Detector>
                            <dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>
                            <dateTypeCA_Detector>creation</dateTypeCA_Detector>
                        </CI_DateCA_Detector>
                    </dateCA_Detector>
                    <editionCA_Detector>version of the cited resource</editionCA_Detector>
                    <editionDateCA_Detector>
                        <dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>
                    </editionDateCA_Detector>
                    <identifierCA_Detector>
                        <MD_IdentifierCA_Detector>
                            <authorityCA_Detector>person or party responsible for
                            maintenance of the namespace</authorityCA_Detector>
                            <codeCA_Detector>alphanumeric value identifying an instance
                            in the namespace</codeCA_Detector>
                        </MD_IdentifierCA_Detector>
                    </identifierCA_Detector>
                    <citedResponsiblePartyCA_Detector>
                        <CI_ResponsiblePartyCA_Detector>
                            <individualNameCA_Detector>name of the responsible person-
                            surname,given name, title separated by a
                            delimiter</individualNameCA_Detector>
```

```
<organisationNameCA_Detector>name of the responsible
organization</organisationNameCA_Detector>
<positionNameCA_Detector>role or position of the responsible
person</positionNameCA_Detector>
<contactInfoCA_Detector>
    <CI_ContactCA_Detector>
        <phoneCA_Detector>
            <CI_TelephoneCA_Detector>
                <voiceCA_Detector>telephone number by which
                individuals can speak to the responsible
                organization or individual</voiceCA_Detector>
                <facsimileCA_Detector>telephone number of a
                facsimile machine for the responsible
                organization or
                individual</facsimileCA_Detector>
            </CI_TelephoneCA_Detector>
        </phoneCA_Detector>
        <addressCA_Detector>
            <CI_AddressCA_Detector>
                <deliveryPointCA_Detector>address line for
                the location</deliveryPointCA_Detector>
                <cityCA_Detector>city of the
                location</cityCA_Detector>
                <administrativeAreaCA_Detector>state,
                province of the
                location</administrativeAreaCA_Detector>
                <postalCodeCA_Detector>ZIP or other postal
                code</postalCodeCA_Detector>
                <countryCA_Detector>country of the physical
                address</countryCA_Detector>
                <electronicMailAddressCA_Detector>telephone
                number of a facsimile machine for the
                responsible organization or
                individual</electronicMailAddressCA_Detector>
            </CI_AddressCA_Detector>
        </addressCA_Detector>
        <onlineResourceCA_Detector>
            <CI_OnlineResourceCA_Detector>
                <linkageCA_Detector>location (address) for
                on-line access using a Uniform Resource
                Locator address or similar addressing
                scheme</linkageCA_Detector>
                <protocolCA_Detector>connection protocol to
                be used</protocolCA_Detector>
                <applicationProfileCA_Detector>name of an
                application profile that can be used with
                the online
                resource</applicationProfileCA_Detector>
                <nameCI_OnlineResourceCA_Detector>name of
                the online
                resource</nameCI_OnlineResourceCA_Detector>

                <descriptionCI_OnlineResourceCA_Detector>detai
                led text description of what the online
                resource
                is/does</descriptionCI_OnlineResourceCA_Detect
                or>

                <functionCA_Detector>download</functionCA_Dete
                ctor>
            </CI_OnlineResourceCA_Detector>
        </onlineResourceCA_Detector>
        <hoursOfServiceCA_Detector>time period (including
        time zone) when individuals can contact the
        organization or individual</hoursOfServiceCA_Detector>
        <contactInstructionsCA_Detector>supplemental
        instructions on how or when to contact the
```

```
                                individual or
                                organization</contactInstructionsCA_Detector>
                            </CI_ContactCA_Detector>
                        </contactInfoCA_Detector>
                        <roleCA_Detector>resourceProvider</roleCA_Detector>
                    </CI_ResponsiblePartyCA_Detector>
                </citedResponsiblePartyCA_Detector>

                <presentationFormCA_Detector>documentDigital</presentationFormCA_Detec
                tor>
                <seriesCA_Detector>
                    <CI_SeriesCA_Detector>
                        <nameCI_SeriesCA_Detector>name of the series, or aggregate
                        dataset, of which the dataset is a
                        part</nameCI_SeriesCA_Detector>
                        <issueIdentificationCA_Detector>information identifying the
                        issue of the series</issueIdentificationCA_Detector>
                        <pageCA_Detector>details on which pages of the publication
                        the article was published</pageCA_Detector>
                    </CI_SeriesCA_Detector>
                </seriesCA_Detector>
                <otherCitationDetailsCA_Detector>other information required to
                complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_Detector>
                <collectiveTitleCA_Detector>common title with holdings
                note</collectiveTitleCA_Detector>
                <ISBNCA_Detector>international Standard Book Number</ISBNCA_Detector>
                <ISSNCA_Detector>international Standard Serial
                Number</ISSNCA_Detector>
            </CI_CitationCA_Detector>
        </citationCA_Detector>
        <abstractCA_Detector>brief narrative summary of the content of the
        resource(s)</abstractCA_Detector>
        <purposeCA_Detector>summary of the intentions with which the resource(s) was
        developed</purposeCA_Detector>
        <creditCA_Detector>recognition of those who contributed to the
        resource(s)</creditCA_Detector>
        <statusCA_Detector>completed</statusCA_Detector>
        <pointOfContactCA_Detector>
            <CI_ResponsiblePartyCA_Detector1>
                <individualNameCA_Detector1>name of the responsible person-
                surname,given name, title separated by a
                delimiter</individualNameCA_Detector1>
                <organisationNameCA_Detector1>name of the responsible
                organization</organisationNameCA_Detector1>
                <positionNameCA_Detector1>role or position of the responsible
                person</positionNameCA_Detector1>
                <contactInfoCA_Detector1>
                    <CI_ContactCA_Detector1>
                        <phoneCA_Detector1>
                            <CI_TelephoneCA_Detector1>
                                <voiceCA_Detector1>telephone number by which
                                individuals can speak to the responsible
                                organization or individual</voiceCA_Detector1>
                                <facsimileCA_Detector1>telephone number of a
                                facsimile machine for the responsible organization
                                or individual</facsimileCA_Detector1>
                            </CI_TelephoneCA_Detector1>
                        </phoneCA_Detector1>
                        <addressCA_Detector1>
                            <CI_AddressCA_Detector1>
                                <deliveryPointCA_Detector1>address line for the
                                location</deliveryPointCA_Detector1>
                                <cityCA_Detector1>city of the
                                location</cityCA_Detector1>
                                <administrativeAreaCA_Detector1>state, province of
                                the location</administrativeAreaCA_Detector1>
```

```
                                    <postalCodeCA_Detector1>ZIP or other postal
                                    code</postalCodeCA_Detector1>
                                    <countryCA_Detector1>country of the physical
                                    address</countryCA_Detector1>
                                    <electronicMailAddressCA_Detector1>telephone number
                                    of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_Detector1>
                                </CI_AddressCA_Detector1>
                            </addressCA_Detector1>
                            <onlineResourceCA_Detector1>
                                <CI_OnlineResourceCA_Detector1>
                                    <linkageCA_Detector1>location (address) for on-line
                                    access using a Uniform Resource Locator address or
                                    similar addressing scheme</linkageCA_Detector1>
                                    <protocolCA_Detector1>connection protocol to be
                                    used</protocolCA_Detector1>
                                    <applicationProfileCA_Detector1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_Detector1>
                                    <nameCI_OnlineResourceCA_Detector1>name of the
                                    online resource</nameCI_OnlineResourceCA_Detector1>
                                    <descriptionCI_OnlineResourceCA_Detector1>detailed
                                    text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Detector1>
                                    <functionCA_Detector1>download</functionCA_Detector1>
                                </CI_OnlineResourceCA_Detector1>
                            </onlineResourceCA_Detector1>
                            <hoursOfServiceCA_Detector1>time period (including time
                            zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_Detector1>
                            <contactInstructionsCA_Detector1>supplemental instructions
                            on how or when to contact the individual or
                            organization</contactInstructionsCA_Detector1>
                        </CI_ContactCA_Detector1>
                    </contactInfoCA_Detector1>
                    <roleCA_Detector1>resourceProvider</roleCA_Detector1>
                </CI_ResponsiblePartyCA_Detector1>
            </pointOfContactCA_Detector>
        </MD_IdentificationCA_Detector>
    </detectorIdentification>
    <sensitivity>response of an individual detector element relative to the
    activation</sensitivity>
    <pixelResponseNonUniformity>inhomogeneities of the response of the detectors of a
    detector array to activation</pixelResponseNonUniformity>
    <darkSignalNonUniformity>response of a detector element if no visible or infrared
    light is present</darkSignalNonUniformity>
    <errorTypeDarkSignalNonUniformity>standardDeviation</errorTypeDarkSignalNonUniformity>
    <errorDarkSignalNonUniformity>0.0</errorDarkSignalNonUniformity>
    <defectPixels>
        <CA_DefectPixels>
            <rowDefectPixels>0</rowDefectPixels>
            <columnDefectPixels>0</columnDefectPixels>
        </CA_DefectPixels>
    </defectPixels>
    <defectPixelsBrightImage>
        <CA_DefectPixelsBrightImage>
            <rowDefectPixelsBrightImage>0</rowDefectPixelsBrightImage>
            <columnDefectPixelsBrightImage>0</columnDefectPixelsBrightImage>
        </CA_DefectPixelsBrightImage>
    </defectPixelsBrightImage>
    <defectPixelsDarkImage>
        <CA_DefectPixelsDarkImage>
            <rowDefectPixelsDarkImage>0</rowDefectPixelsDarkImage>
            <columnDefectPixelsDarkImage>0</columnDefectPixelsDarkImage>
        </CA_DefectPixelsDarkImage>
    </defectPixelsDarkImage>
```

```
        <artefacts>description of other deficiencies of the detector</artefacts>
        <maximumAllowedDefectPixels>0</maximumAllowedDefectPixels>
        <maximumAllowedDefectPixelsDoubleColumn>0</maximumAllowedDefectPixelsDoubleColumn>
        <maximumAllowedDefectPixelsSingleColumn>0</maximumAllowedDefectPixelsSingleColumn>
    </CA_DetectorDemands>
    <CA_DetectorOptics>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
                        <alternateTitleCA_RadiometryInSensor>short name or other language
                        name by which the cited information is
                        known</alternateTitleCA_RadiometryInSensor>
                        <dateCA_RadiometryInSensor>
                            <CI_DateCA_RadiometryInSensor>

                                <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                                diometryInSensor>

                                <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                                InSensor>
                            </CI_DateCA_RadiometryInSensor>
                        </dateCA_RadiometryInSensor>
                        <editionCA_RadiometryInSensor>version of the cited
                        resource</editionCA_RadiometryInSensor>
                        <editionDateCA_RadiometryInSensor>

                            <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
                            A_RadiometryInSensor>
                        </editionDateCA_RadiometryInSensor>
                        <identifierCA_RadiometryInSensor>
                            <MD_IdentifierCA_RadiometryInSensor>
                                <authorityCA_RadiometryInSensor>person or party responsible
                                for maintenance of the
                                namespace</authorityCA_RadiometryInSensor>
                                <codeCA_RadiometryInSensor>alphanumeric value identifying an
                                instance in the namespace</codeCA_RadiometryInSensor>
                            </MD_IdentifierCA_RadiometryInSensor>
                        </identifierCA_RadiometryInSensor>
                        <citedResponsiblePartyCA_RadiometryInSensor>
                            <CI_ResponsiblePartyCA_RadiometryInSensor>
                                <individualNameCA_RadiometryInSensor>name of the responsible
                                person- surname,given name, title separated by a
                                delimiter</individualNameCA_RadiometryInSensor>
                                <organisationNameCA_RadiometryInSensor>name of the
                                responsible
                                organization</organisationNameCA_RadiometryInSensor>
                                <positionNameCA_RadiometryInSensor>role or position of the
                                responsible person</positionNameCA_RadiometryInSensor>
                                <contactInfoCA_RadiometryInSensor>
                                    <CI_ContactCA_RadiometryInSensor>
                                        <phoneCA_RadiometryInSensor>
                                            <CI_TelephoneCA_RadiometryInSensor>
                                                <voiceCA_RadiometryInSensor>telephone number
                                                by which individuals can speak to the
```

```
                responsible organization or
                individual</voiceCA_RadiometryInSensor>
                <facsimileCA_RadiometryInSensor>telephone
                number of a facsimile machine for the
                responsible organization or
                individual</facsimileCA_RadiometryInSensor>
            </CI_TelephoneCA_RadiometryInSensor>
        </phoneCA_RadiometryInSensor>
        <addressCA_RadiometryInSensor>
            <CI_AddressCA_RadiometryInSensor>
                <deliveryPointCA_RadiometryInSensor>address
                line for the
                location</deliveryPointCA_RadiometryInSensor>
                <cityCA_RadiometryInSensor>city of the
                location</cityCA_RadiometryInSensor>

                <administrativeAreaCA_RadiometryInSensor>state
                , province of the
                location</administrativeAreaCA_RadiometryInSen
                sor>
                <postalCodeCA_RadiometryInSensor>ZIP or
                other postal
                code</postalCodeCA_RadiometryInSensor>
                <countryCA_RadiometryInSensor>country of the
                physical
                address</countryCA_RadiometryInSensor>

                <electronicMailAddressCA_RadiometryInSensor>te
                lephone number of a facsimile machine for
                the responsible organization or
                individual</electronicMailAddressCA_Radiometry
                InSensor>
            </CI_AddressCA_RadiometryInSensor>
        </addressCA_RadiometryInSensor>
        <onlineResourceCA_RadiometryInSensor>
            <CI_OnlineResourceCA_RadiometryInSensor>
                <linkageCA_RadiometryInSensor>location
                (address) for on-line access using a Uniform
                Resource Locator address or similar
                addressing
                scheme</linkageCA_RadiometryInSensor>
                <protocolCA_RadiometryInSensor>connection
                protocol to be
                used</protocolCA_RadiometryInSensor>

                <applicationProfileCA_RadiometryInSensor>name
                of an application profile that can be used
                with the online
                resource</applicationProfileCA_RadiometryInSen
                sor>

                <nameCI_OnlineResourceCA_RadiometryInSensor>na
                me of the online
                resource</nameCI_OnlineResourceCA_RadiometryIn
                Sensor>

                <descriptionCI_OnlineResourceCA_RadiometryInSe
                nsor>detailed text description of what the
                online resource
                is/does</descriptionCI_OnlineResourceCA_Radiom
                etryInSensor>

                <functionCA_RadiometryInSensor>download</funct
                ionCA_RadiometryInSensor>
            </CI_OnlineResourceCA_RadiometryInSensor>
        </onlineResourceCA_RadiometryInSensor>
        <hoursOfServiceCA_RadiometryInSensor>time period
```

```
                                (including time zone) when individuals can contact
                                the organization or
                                individual</hoursOfServiceCA_RadiometryInSensor>

                                <contactInstructionsCA_RadiometryInSensor>supplemental
                                 instructions on how or when to contact the
                                individual or
                                organization</contactInstructionsCA_RadiometryInSensor
                                >
                            </CI_ContactCA_RadiometryInSensor>
                        </contactInfoCA_RadiometryInSensor>

                        <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                        InSensor>
                    </CI_ResponsiblePartyCA_RadiometryInSensor>
                </citedResponsiblePartyCA_RadiometryInSensor>

                <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
                rmCA_RadiometryInSensor>
                <seriesCA_RadiometryInSensor>
                    <CI_SeriesCA_RadiometryInSensor>
                        <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryInSensor>
                        <issueIdentificationCA_RadiometryInSensor>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
```

```
                                    <facsimileCA_RadiometryInSensor1>telephone number of
                                    a facsimile machine for the responsible organization
                                    or individual</facsimileCA_RadiometryInSensor1>
                                </CI_TelephoneCA_RadiometryInSensor1>
                            </phoneCA_RadiometryInSensor1>
                            <addressCA_RadiometryInSensor1>
                                <CI_AddressCA_RadiometryInSensor1>
                                    <deliveryPointCA_RadiometryInSensor1>address line
                                    for the location</deliveryPointCA_RadiometryInSensor1>
                                    <cityCA_RadiometryInSensor1>city of the
                                    location</cityCA_RadiometryInSensor1>
                                    <administrativeAreaCA_RadiometryInSensor1>state,
                                    province of the
                                    location</administrativeAreaCA_RadiometryInSensor1>
                                    <postalCodeCA_RadiometryInSensor1>ZIP or other
                                    postal code</postalCodeCA_RadiometryInSensor1>
                                    <countryCA_RadiometryInSensor1>country of the
                                    physical address</countryCA_RadiometryInSensor1>

                                    <electronicMailAddressCA_RadiometryInSensor1>telephone
                                     number of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <detectorIdentification>
```

```
<MD_IdentificationCA_Detector>
    <citationCA_Detector>
        <CI_CitationCA_Detector>
            <titleCA_Detector>name by which the cited resource is
            known</titleCA_Detector>
            <alternateTitleCA_Detector>short name or other language name by
            which the cited information is known</alternateTitleCA_Detector>
            <dateCA_Detector>
                <CI_DateCA_Detector>
                    <dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>
                    <dateTypeCA_Detector>creation</dateTypeCA_Detector>
                </CI_DateCA_Detector>
            </dateCA_Detector>
            <editionCA_Detector>version of the cited resource</editionCA_Detector>
            <editionDateCA_Detector>
                <dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>
            </editionDateCA_Detector>
            <identifierCA_Detector>
                <MD_IdentifierCA_Detector>
                    <authorityCA_Detector>person or party responsible for
                    maintenance of the namespace</authorityCA_Detector>
                    <codeCA_Detector>alphanumeric value identifying an instance
                    in the namespace</codeCA_Detector>
                </MD_IdentifierCA_Detector>
            </identifierCA_Detector>
            <citedResponsiblePartyCA_Detector>
                <CI_ResponsiblePartyCA_Detector>
                    <individualNameCA_Detector>name of the responsible person-
                    surname,given name, title separated by a
                    delimiter</individualNameCA_Detector>
                    <organisationNameCA_Detector>name of the responsible
                    organization</organisationNameCA_Detector>
                    <positionNameCA_Detector>role or position of the responsible
                    person</positionNameCA_Detector>
                    <contactInfoCA_Detector>
                        <CI_ContactCA_Detector>
                            <phoneCA_Detector>
                                <CI_TelephoneCA_Detector>
                                    <voiceCA_Detector>telephone number by which
                                    individuals can speak to the responsible
                                    organization or individual</voiceCA_Detector>
                                    <facsimileCA_Detector>telephone number of a
                                    facsimile machine for the responsible
                                    organization or
                                    individual</facsimileCA_Detector>
                                </CI_TelephoneCA_Detector>
                            </phoneCA_Detector>
                            <addressCA_Detector>
                                <CI_AddressCA_Detector>
                                    <deliveryPointCA_Detector>address line for
                                    the location</deliveryPointCA_Detector>
                                    <cityCA_Detector>city of the
                                    location</cityCA_Detector>
                                    <administrativeAreaCA_Detector>state,
                                    province of the
                                    location</administrativeAreaCA_Detector>
                                    <postalCodeCA_Detector>ZIP or other postal
                                    code</postalCodeCA_Detector>
                                    <countryCA_Detector>country of the physical
                                    address</countryCA_Detector>
                                    <electronicMailAddressCA_Detector>telephone
                                    number of a facsimile machine for the
                                    responsible organization or
                                    individual</electronicMailAddressCA_Detector>
                                </CI_AddressCA_Detector>
                            </addressCA_Detector>
                            <onlineResourceCA_Detector>
```

```
                                    <CI_OnlineResourceCA_Detector>
                                        <linkageCA_Detector>location (address) for
                                        on-line access using a Uniform Resource
                                        Locator address or similar addressing
                                        scheme</linkageCA_Detector>
                                        <protocolCA_Detector>connection protocol to
                                        be used</protocolCA_Detector>
                                        <applicationProfileCA_Detector>name of an
                                        application profile that can be used with
                                        the online
                                        resource</applicationProfileCA_Detector>
                                        <nameCI_OnlineResourceCA_Detector>name of
                                        the online
                                        resource</nameCI_OnlineResourceCA_Detector>

                                        <descriptionCI_OnlineResourceCA_Detector>detai
                                        led text description of what the online
                                        resource
                                        is/does</descriptionCI_OnlineResourceCA_Detect
                                        or>

                                        <functionCA_Detector>download</functionCA_Dete
                                        ctor>
                                    </CI_OnlineResourceCA_Detector>
                                </onlineResourceCA_Detector>
                                <hoursOfServiceCA_Detector>time period (including
                                time zone) when individuals can contact the
                                organization or individual</hoursOfServiceCA_Detector>
                                <contactInstructionsCA_Detector>supplemental
                                instructions on how or when to contact the
                                individual or
                                organization</contactInstructionsCA_Detector>
                            </CI_ContactCA_Detector>
                        </contactInfoCA_Detector>
                        <roleCA_Detector>resourceProvider</roleCA_Detector>
                    </CI_ResponsiblePartyCA_Detector>
                </citedResponsiblePartyCA_Detector>

                <presentationFormCA_Detector>documentDigital</presentationFormCA_Detec
                tor>
                <seriesCA_Detector>
                    <CI_SeriesCA_Detector>
                        <nameCI_SeriesCA_Detector>name of the series, or aggregate
                        dataset, of which the dataset is a
                        part</nameCI_SeriesCA_Detector>
                        <issueIdentificationCA_Detector>information identifying the
                        issue of the series</issueIdentificationCA_Detector>
                        <pageCA_Detector>details on which pages of the publication
                        the article was published</pageCA_Detector>
                    </CI_SeriesCA_Detector>
                </seriesCA_Detector>
                <otherCitationDetailsCA_Detector>other information required to
                complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_Detector>
                <collectiveTitleCA_Detector>common title with holdings
                note</collectiveTitleCA_Detector>
                <ISBNCA_Detector>international Standard Book Number</ISBNCA_Detector>
                <ISSNCA_Detector>international Standard Serial
                Number</ISSNCA_Detector>
            </CI_CitationCA_Detector>
        </citationCA_Detector>
        <abstractCA_Detector>brief narrative summary of the content of the
        resource(s)</abstractCA_Detector>
        <purposeCA_Detector>summary of the intentions with which the resource(s) was
        developed</purposeCA_Detector>
        <creditCA_Detector>recognition of those who contributed to the
        resource(s)</creditCA_Detector>
```

```
<statusCA_Detector>completed</statusCA_Detector>
<pointOfContactCA_Detector>
    <CI_ResponsiblePartyCA_Detector1>
        <individualNameCA_Detector1>name of the responsible person-
        surname,given name, title separated by a
        delimiter</individualNameCA_Detector1>
        <organisationNameCA_Detector1>name of the responsible
        organization</organisationNameCA_Detector1>
        <positionNameCA_Detector1>role or position of the responsible
        person</positionNameCA_Detector1>
        <contactInfoCA_Detector1>
            <CI_ContactCA_Detector1>
                <phoneCA_Detector1>
                    <CI_TelephoneCA_Detector1>
                        <voiceCA_Detector1>telephone number by which
                        individuals can speak to the responsible
                        organization or individual</voiceCA_Detector1>
                        <facsimileCA_Detector1>telephone number of a
                        facsimile machine for the responsible organization
                        or individual</facsimileCA_Detector1>
                    </CI_TelephoneCA_Detector1>
                </phoneCA_Detector1>
                <addressCA_Detector1>
                    <CI_AddressCA_Detector1>
                        <deliveryPointCA_Detector1>address line for the
                        location</deliveryPointCA_Detector1>
                        <cityCA_Detector1>city of the
                        location</cityCA_Detector1>
                        <administrativeAreaCA_Detector1>state, province of
                        the location</administrativeAreaCA_Detector1>
                        <postalCodeCA_Detector1>ZIP or other postal
                        code</postalCodeCA_Detector1>
                        <countryCA_Detector1>country of the physical
                        address</countryCA_Detector1>
                        <electronicMailAddressCA_Detector1>telephone number
                        of a facsimile machine for the responsible
                        organization or
                        individual</electronicMailAddressCA_Detector1>
                    </CI_AddressCA_Detector1>
                </addressCA_Detector1>
                <onlineResourceCA_Detector1>
                    <CI_OnlineResourceCA_Detector1>
                        <linkageCA_Detector1>location (address) for on-line
                        access using a Uniform Resource Locator address or
                        similar addressing scheme</linkageCA_Detector1>
                        <protocolCA_Detector1>connection protocol to be
                        used</protocolCA_Detector1>
                        <applicationProfileCA_Detector1>name of an
                        application profile that can be used with the online
                        resource</applicationProfileCA_Detector1>
                        <nameCI_OnlineResourceCA_Detector1>name of the
                        online resource</nameCI_OnlineResourceCA_Detector1>
                        <descriptionCI_OnlineResourceCA_Detector1>detailed
                        text description of what the online resource
                        is/does</descriptionCI_OnlineResourceCA_Detector1>
                        <functionCA_Detector1>download</functionCA_Detector1>
                    </CI_OnlineResourceCA_Detector1>
                </onlineResourceCA_Detector1>
                <hoursOfServiceCA_Detector1>time period (including time
                zone) when individuals can contact the organization or
                individual</hoursOfServiceCA_Detector1>
                <contactInstructionsCA_Detector1>supplemental instructions
                on how or when to contact the individual or
                organization</contactInstructionsCA_Detector1>
            </CI_ContactCA_Detector1>
        </contactInfoCA_Detector1>
        <roleCA_Detector1>resourceProvider</roleCA_Detector1>
```

```
                    </CI_ResponsiblePartyCA_Detector1>
                </pointOfContactCA_Detector>
            </MD_IdentificationCA_Detector>
        </detectorIdentification>
        <lightFalloff>decrease of activation of detector elements toward the border/end of
        the detector array due to the imperfection of the lens</lightFalloff>
    </CA_DetectorOptics>
    <CA_Distortion>
        <princPointOfSymmetry>0.0</princPointOfSymmetry>
        <qualityOfPrincPointOfSymmetry>
            <DQ_QuantitativeAttributeAccuracySD_Distortion>
                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
                element</standaloneQualityReportDetailsSD_Distortion>
            </DQ_QuantitativeAttributeAccuracySD_Distortion>
        </qualityOfPrincPointOfSymmetry>
        <selfCalibrationModel>brown</selfCalibrationModel>
        <radialDistortion>
            <CA_RadialDistortion>
                <numberCoefficients>0</numberCoefficients>
                <k>0.0</k>
            </CA_RadialDistortion>
        </radialDistortion>
        <decenteringDistortion>
            <CA_DecenteringDistortion>
                <p1>0.0</p1>
                <p2>0.0</p2>
            </CA_DecenteringDistortion>
        </decenteringDistortion>
        <affineDistortion>
            <CA_AffineDistortion>
                <a1>0.0</a1>
                <a2>0.0</a2>
            </CA_AffineDistortion>
        </affineDistortion>
        <tangentialDistortion>
            <CA_TangentialDistortion>
                <t1>0.0</t1>
                <t2>0.0</t2>
            </CA_TangentialDistortion>
        </tangentialDistortion>
        <affineFraserDistortion>
            <CA_AffineFraserDistortion>
                <f1>0.0</f1>
                <f2>0.0</f2>
            </CA_AffineFraserDistortion>
        </affineFraserDistortion>
        <smacParameters>
            <CA_SMACParameters>
                <k>0.0</k>
                <p1>0.0</p1>
                <p2>0.0</p2>
            </CA_SMACParameters>
        </smacParameters>
        <ebnerParameters>
            <CA_EbnerParameters>
                <e1>0.0</e1>
                <e2>0.0</e2>
                <e3>0.0</e3>
                <e4>0.0</e4>
                <e5>0.0</e5>
                <e6>0.0</e6>
                <e7>0.0</e7>
                <e8>0.0</e8>
                <e9>0.0</e9>
                <e10>0.0</e10>
                <e11>0.0</e11>
                <e12>0.0</e12>
```

```
            </CA_EbnerParameters>
        </ebnerParameters>
        <jacobsenParameters>
            <CA_JacobsenParameters>
                <j1>0.0</j1>
                <j2>0.0</j2>
                <j3>0.0</j3>
                <j4>0.0</j4>
                <j5>0.0</j5>
                <j6>0.0</j6>
                <j7>0.0</j7>
                <j8>0.0</j8>
                <j9>0.0</j9>
                <j10>0.0</j10>
                <j11>0.0</j11>
                <j12>0.0</j12>
                <j13>0.0</j13>
                <j14>0.0</j14>
                <j15>0.0</j15>
            </CA_JacobsenParameters>
        </jacobsenParameters>
        <software>name of the software product applied for the calibration
        processing</software>
        <propertiesAlgorithm>name and the properties of the algorithm that is programmed in
        the software</propertiesAlgorithm>
        <sigmaNaught uom="#m">0.0</sigmaNaught>
    </CA_Distortion>
    <CA_DistortionPolynomial>
        <princPointOfSymmetry>0.0</princPointOfSymmetry>
        <qualityOfPrincPointOfSymmetry>
            <DQ_QuantitativeAttributeAccuracySD_Distortion>
                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
                element</standaloneQualityReportDetailsSD_Distortion>
            </DQ_QuantitativeAttributeAccuracySD_Distortion>
        </qualityOfPrincPointOfSymmetry>
        <polynomialDecentering>
            <SD_PolynomialFunction1>
                <resultDimension1>column</resultDimension1>
            </SD_PolynomialFunction1>
        </polynomialDecentering>
        <polynomialRadial>
            <SD_PolynomialFunction2>
                <resultDimension2>column</resultDimension2>
            </SD_PolynomialFunction2>
        </polynomialRadial>
        <qualityOfPolynomialRadial>
            <DQ_PositionalAccuracySD_DistortionPolynomial>
                <standaloneQualityReportDetailsSD_DistortionPolynomial>description of the
                data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial>
            </DQ_PositionalAccuracySD_DistortionPolynomial>
        </qualityOfPolynomialRadial>
        <qualityOfPolynomialDecentering>
            <DQ_PositionalAccuracySD_DistortionPolynomial1>
                <standaloneQualityReportDetailsSD_DistortionPolynomial1>description of the
                data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial1>
            </DQ_PositionalAccuracySD_DistortionPolynomial1>
        </qualityOfPolynomialDecentering>
        <polynomialDegree>0</polynomialDegree>
        <polynomialCoefficients>0.0</polynomialCoefficients>
        <thinSplineDegree>0</thinSplineDegree>
        <thinSplineCoefficients>0.0</thinSplineCoefficients>
    </CA_DistortionPolynomial>
    <CA_Documentation>
        <certificateIdentification>
            <MD_IdentifierCA_Documentation>
                <authorityCA_Documentation>person or party responsible for maintenance of
                the namespace</authorityCA_Documentation>
```

```
                <codeCA_Documentation>alphanumeric value identifying an instance in the
                namespace</codeCA_Documentation>
            </MD_IdentifierCA_Documentation>
        </certificateIdentification>
        <dataProductLevel>rawData</dataProductLevel>
        <geometricQuality>
            <CA_PositionalErrorCA_Documentation>
                <errorXCA_Documentation uom="#m">0.0</errorXCA_Documentation>
                <errorYCA_Documentation uom="#m">0.0</errorYCA_Documentation>
                <errorZCA_Documentation uom="#m">0.0</errorZCA_Documentation>
                <errorXYCA_Documentation uom="#m">0.0</errorXYCA_Documentation>
                <errorXYZCA_Documentation uom="#m">0.0</errorXYZCA_Documentation>
                <pointTypeCA_Documentation>controlPoint</pointTypeCA_Documentation>
                <errorTypeCA_Documentation>standardDeviation</errorTypeCA_Documentation>
                <quantityTypeCA_Documentation>minimum</quantityTypeCA_Documentation>
            </CA_PositionalErrorCA_Documentation>
        </geometricQuality>
        <geometricRadialResolution>
            <geometricResolutionCA_Documentation>0.0</geometricResolutionCA_Documentation>
        </geometricRadialResolution>
        <geometricTangentialResolution>
            <geometricResolutionCA_Documentation1>0.0</geometricResolutionCA_Documentation1>
        </geometricTangentialResolution>
        <radiometricQuality>
            <DQ_QuantitativeAttributeAccuracyCA_Documentation>
                <standaloneQualityReportDetailsCA_Documentation>description of the data
                quality element</standaloneQualityReportDetailsCA_Documentation>
            </DQ_QuantitativeAttributeAccuracyCA_Documentation>
        </radiometricQuality>
        <stabilizedPlatform>information about the applied stabilized
        platform</stabilizedPlatform>
    </CA_Documentation>
    <CA_DynamicRange>
        <minimumGreyValue>0.0</minimumGreyValue>
        <maximumGreyValue>0.0</maximumGreyValue>
    </CA_DynamicRange>
    <CA_EbnerParameters>
        <e1>0.0</e1>
        <e2>0.0</e2>
        <e3>0.0</e3>
        <e4>0.0</e4>
        <e5>0.0</e5>
        <e6>0.0</e6>
        <e7>0.0</e7>
        <e8>0.0</e8>
        <e9>0.0</e9>
        <e10>0.0</e10>
        <e11>0.0</e11>
        <e12>0.0</e12>
    </CA_EbnerParameters>
    <CA_ElectronicCell>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
```

```
<alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is
known</alternateTitleCA_RadiometryInSensor>
<dateCA_RadiometryInSensor>
    <CI_DateCA_RadiometryInSensor>

        <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
        diometryInSensor>

        <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
        InSensor>
    </CI_DateCA_RadiometryInSensor>
</dateCA_RadiometryInSensor>
<editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>
<editionDateCA_RadiometryInSensor>

    <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
    A_RadiometryInSensor>
</editionDateCA_RadiometryInSensor>
<identifierCA_RadiometryInSensor>
    <MD_IdentifierCA_RadiometryInSensor>
        <authorityCA_RadiometryInSensor>person or party responsible
        for maintenance of the
        namespace</authorityCA_RadiometryInSensor>
        <codeCA_RadiometryInSensor>alphanumeric value identifying an
        instance in the namespace</codeCA_RadiometryInSensor>
    </MD_IdentifierCA_RadiometryInSensor>
</identifierCA_RadiometryInSensor>
<citedResponsiblePartyCA_RadiometryInSensor>
    <CI_ResponsiblePartyCA_RadiometryInSensor>
        <individualNameCA_RadiometryInSensor>name of the responsible
        person- surname,given name, title separated by a
        delimiter</individualNameCA_RadiometryInSensor>
        <organisationNameCA_RadiometryInSensor>name of the
        responsible
        organization</organisationNameCA_RadiometryInSensor>
        <positionNameCA_RadiometryInSensor>role or position of the
        responsible person</positionNameCA_RadiometryInSensor>
        <contactInfoCA_RadiometryInSensor>
            <CI_ContactCA_RadiometryInSensor>
                <phoneCA_RadiometryInSensor>
                    <CI_TelephoneCA_RadiometryInSensor>
                        <voiceCA_RadiometryInSensor>telephone number
                        by which individuals can speak to the
                        responsible organization or
                        individual</voiceCA_RadiometryInSensor>
                        <facsimileCA_RadiometryInSensor>telephone
                        number of a facsimile machine for the
                        responsible organization or
                        individual</facsimileCA_RadiometryInSensor>
                    </CI_TelephoneCA_RadiometryInSensor>
                </phoneCA_RadiometryInSensor>
                <addressCA_RadiometryInSensor>
                    <CI_AddressCA_RadiometryInSensor>
                        <deliveryPointCA_RadiometryInSensor>address
                        line for the
                        location</deliveryPointCA_RadiometryInSensor>
                        <cityCA_RadiometryInSensor>city of the
                        location</cityCA_RadiometryInSensor>

                        <administrativeAreaCA_RadiometryInSensor>state
                        , province of the
                        location</administrativeAreaCA_RadiometryInSen
                        sor>
                        <postalCodeCA_RadiometryInSensor>ZIP or
                        other postal
```

```
                                code</postalCodeCA_RadiometryInSensor>
                                <countryCA_RadiometryInSensor>country of the
                                physical
                                address</countryCA_RadiometryInSensor>

                                <electronicMailAddressCA_RadiometryInSensor>te
                                lephone number of a facsimile machine for
                                the responsible organization or
                                individual</electronicMailAddressCA_Radiometry
                                InSensor>
                            </CI_AddressCA_RadiometryInSensor>
                        </addressCA_RadiometryInSensor>
                        <onlineResourceCA_RadiometryInSensor>
                            <CI_OnlineResourceCA_RadiometryInSensor>
                                <linkageCA_RadiometryInSensor>location
                                (address) for on-line access using a Uniform
                                Resource Locator address or similar
                                addressing
                                scheme</linkageCA_RadiometryInSensor>
                                <protocolCA_RadiometryInSensor>connection
                                protocol to be
                                used</protocolCA_RadiometryInSensor>

                                <applicationProfileCA_RadiometryInSensor>name
                                of an application profile that can be used
                                with the online
                                resource</applicationProfileCA_RadiometryInSen
                                sor>

                                <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                me of the online
                                resource</nameCI_OnlineResourceCA_RadiometryIn
                                Sensor>

                                <descriptionCI_OnlineResourceCA_RadiometryInSe
                                nsor>detailed text description of what the
                                online resource
                                is/does</descriptionCI_OnlineResourceCA_Radiom
                                etryInSensor>

                                <functionCA_RadiometryInSensor>download</funct
                                ionCA_RadiometryInSensor>
                            </CI_OnlineResourceCA_RadiometryInSensor>
                        </onlineResourceCA_RadiometryInSensor>
                        <hoursOfServiceCA_RadiometryInSensor>time period
                        (including time zone) when individuals can contact
                        the organization or
                        individual</hoursOfServiceCA_RadiometryInSensor>

                        <contactInstructionsCA_RadiometryInSensor>supplemental
                         instructions on how or when to contact the
                        individual or
                        organization</contactInstructionsCA_RadiometryInSensor
                        >
                    </CI_ContactCA_RadiometryInSensor>
                </contactInfoCA_RadiometryInSensor>

                <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                InSensor>
            </CI_ResponsiblePartyCA_RadiometryInSensor>
        </citedResponsiblePartyCA_RadiometryInSensor>

        <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
        rmCA_RadiometryInSensor>
        <seriesCA_RadiometryInSensor>
            <CI_SeriesCA_RadiometryInSensor>
                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
```

```
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryInSensor>
                        <issueIdentificationCA_RadiometryInSensor>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
```

```
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <detectorIdentification>
        <MD_IdentificationCA_Detector>
            <citationCA_Detector>
                <CI_CitationCA_Detector>
                    <titleCA_Detector>name by which the cited resource is
                    known</titleCA_Detector>
                    <alternateTitleCA_Detector>short name or other language name by
                    which the cited information is known</alternateTitleCA_Detector>
                    <dateCA_Detector>
                        <CI_DateCA_Detector>
                            <dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>
                            <dateTypeCA_Detector>creation</dateTypeCA_Detector>
                        </CI_DateCA_Detector>
                    </dateCA_Detector>
                    <editionCA_Detector>version of the cited resource</editionCA_Detector>
                    <editionDateCA_Detector>
                        <dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>
                    </editionDateCA_Detector>
                    <identifierCA_Detector>
                        <MD_IdentifierCA_Detector>
                            <authorityCA_Detector>person or party responsible for
                            maintenance of the namespace</authorityCA_Detector>
                            <codeCA_Detector>alphanumeric value identifying an instance
```

```
                    in the namespace</codeCA_Detector>
                </MD_IdentifierCA_Detector>
            </identifierCA_Detector>
            <citedResponsiblePartyCA_Detector>
                <CI_ResponsiblePartyCA_Detector>
                    <individualNameCA_Detector>name of the responsible person-
                    surname,given name, title separated by a
                    delimiter</individualNameCA_Detector>
                    <organisationNameCA_Detector>name of the responsible
                    organization</organisationNameCA_Detector>
                    <positionNameCA_Detector>role or position of the responsible
                    person</positionNameCA_Detector>
                    <contactInfoCA_Detector>
                        <CI_ContactCA_Detector>
                            <phoneCA_Detector>
                                <CI_TelephoneCA_Detector>
                                    <voiceCA_Detector>telephone number by which
                                    individuals can speak to the responsible
                                    organization or individual</voiceCA_Detector>
                                    <facsimileCA_Detector>telephone number of a
                                    facsimile machine for the responsible
                                    organization or
                                    individual</facsimileCA_Detector>
                                </CI_TelephoneCA_Detector>
                            </phoneCA_Detector>
                            <addressCA_Detector>
                                <CI_AddressCA_Detector>
                                    <deliveryPointCA_Detector>address line for
                                    the location</deliveryPointCA_Detector>
                                    <cityCA_Detector>city of the
                                    location</cityCA_Detector>
                                    <administrativeAreaCA_Detector>state,
                                    province of the
                                    location</administrativeAreaCA_Detector>
                                    <postalCodeCA_Detector>ZIP or other postal
                                    code</postalCodeCA_Detector>
                                    <countryCA_Detector>country of the physical
                                    address</countryCA_Detector>
                                    <electronicMailAddressCA_Detector>telephone
                                    number of a facsimile machine for the
                                    responsible organization or
                                    individual</electronicMailAddressCA_Detector>
                                </CI_AddressCA_Detector>
                            </addressCA_Detector>
                            <onlineResourceCA_Detector>
                                <CI_OnlineResourceCA_Detector>
                                    <linkageCA_Detector>location (address) for
                                    on-line access using a Uniform Resource
                                    Locator address or similar addressing
                                    scheme</linkageCA_Detector>
                                    <protocolCA_Detector>connection protocol to
                                    be used</protocolCA_Detector>
                                    <applicationProfileCA_Detector>name of an
                                    application profile that can be used with
                                    the online
                                    resource</applicationProfileCA_Detector>
                                    <nameCI_OnlineResourceCA_Detector>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_Detector>

                                    <descriptionCI_OnlineResourceCA_Detector>detai
                                    led text description of what the online
                                    resource
                                    is/does</descriptionCI_OnlineResourceCA_Detect
                                    or>

                                    <functionCA_Detector>download</functionCA_Dete
```

```
                                    ctor>
                                </CI_OnlineResourceCA_Detector>
                            </onlineResourceCA_Detector>
                            <hoursOfServiceCA_Detector>time period (including
                            time zone) when individuals can contact the
                            organization or individual</hoursOfServiceCA_Detector>
                            <contactInstructionsCA_Detector>supplemental
                            instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_Detector>
                        </CI_ContactCA_Detector>
                    </contactInfoCA_Detector>
                    <roleCA_Detector>resourceProvider</roleCA_Detector>
                </CI_ResponsiblePartyCA_Detector>
            </citedResponsiblePartyCA_Detector>

            <presentationFormCA_Detector>documentDigital</presentationFormCA_Detec
            tor>
            <seriesCA_Detector>
                <CI_SeriesCA_Detector>
                    <nameCI_SeriesCA_Detector>name of the series, or aggregate
                    dataset, of which the dataset is a
                    part</nameCI_SeriesCA_Detector>
                    <issueIdentificationCA_Detector>information identifying the
                    issue of the series</issueIdentificationCA_Detector>
                    <pageCA_Detector>details on which pages of the publication
                    the article was published</pageCA_Detector>
                </CI_SeriesCA_Detector>
            </seriesCA_Detector>
            <otherCitationDetailsCA_Detector>other information required to
            complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_Detector>
            <collectiveTitleCA_Detector>common title with holdings
            note</collectiveTitleCA_Detector>
            <ISBNCA_Detector>international Standard Book Number</ISBNCA_Detector>
            <ISSNCA_Detector>international Standard Serial
            Number</ISSNCA_Detector>
        </CI_CitationCA_Detector>
    </citationCA_Detector>
    <abstractCA_Detector>brief narrative summary of the content of the
    resource(s)</abstractCA_Detector>
    <purposeCA_Detector>summary of the intentions with which the resource(s) was
    developed</purposeCA_Detector>
    <creditCA_Detector>recognition of those who contributed to the
    resource(s)</creditCA_Detector>
    <statusCA_Detector>completed</statusCA_Detector>
    <pointOfContactCA_Detector>
        <CI_ResponsiblePartyCA_Detector1>
            <individualNameCA_Detector1>name of the responsible person-
            surname,given name, title separated by a
            delimiter</individualNameCA_Detector1>
            <organisationNameCA_Detector1>name of the responsible
            organization</organisationNameCA_Detector1>
            <positionNameCA_Detector1>role or position of the responsible
            person</positionNameCA_Detector1>
            <contactInfoCA_Detector1>
                <CI_ContactCA_Detector1>
                    <phoneCA_Detector1>
                        <CI_TelephoneCA_Detector1>
                            <voiceCA_Detector1>telephone number by which
                            individuals can speak to the responsible
                            organization or individual</voiceCA_Detector1>
                            <facsimileCA_Detector1>telephone number of a
                            facsimile machine for the responsible organization
                            or individual</facsimileCA_Detector1>
                        </CI_TelephoneCA_Detector1>
                    </phoneCA_Detector1>
```

```
                        <addressCA_Detector1>
                            <CI_AddressCA_Detector1>
                                <deliveryPointCA_Detector1>address line for the
                                location</deliveryPointCA_Detector1>
                                <cityCA_Detector1>city of the
                                location</cityCA_Detector1>
                                <administrativeAreaCA_Detector1>state, province of
                                the location</administrativeAreaCA_Detector1>
                                <postalCodeCA_Detector1>ZIP or other postal
                                code</postalCodeCA_Detector1>
                                <countryCA_Detector1>country of the physical
                                address</countryCA_Detector1>
                                <electronicMailAddressCA_Detector1>telephone number
                                of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_Detector1>
                            </CI_AddressCA_Detector1>
                        </addressCA_Detector1>
                        <onlineResourceCA_Detector1>
                            <CI_OnlineResourceCA_Detector1>
                                <linkageCA_Detector1>location (address) for on-line
                                access using a Uniform Resource Locator address or
                                similar addressing scheme</linkageCA_Detector1>
                                <protocolCA_Detector1>connection protocol to be
                                used</protocolCA_Detector1>
                                <applicationProfileCA_Detector1>name of an
                                application profile that can be used with the online
                                resource</applicationProfileCA_Detector1>
                                <nameCI_OnlineResourceCA_Detector1>name of the
                                online resource</nameCI_OnlineResourceCA_Detector1>
                                <descriptionCI_OnlineResourceCA_Detector1>detailed
                                text description of what the online resource
                                is/does</descriptionCI_OnlineResourceCA_Detector1>
                                <functionCA_Detector1>download</functionCA_Detector1>
                            </CI_OnlineResourceCA_Detector1>
                        </onlineResourceCA_Detector1>
                        <hoursOfServiceCA_Detector1>time period (including time
                        zone) when individuals can contact the organization or
                        individual</hoursOfServiceCA_Detector1>
                        <contactInstructionsCA_Detector1>supplemental instructions
                        on how or when to contact the individual or
                        organization</contactInstructionsCA_Detector1>
                    </CI_ContactCA_Detector1>
                </contactInfoCA_Detector1>
                <roleCA_Detector1>resourceProvider</roleCA_Detector1>
            </CI_ResponsiblePartyCA_Detector1>
        </pointOfContactCA_Detector>
    </MD_IdentificationCA_Detector>
</detectorIdentification>
<sensitivity>response of an individual detector element relative to the
activation</sensitivity>
<pixelResponseNonUniformity>inhomogenities of the response of the detectors of a
detector array to activation</pixelResponseNonUniformity>
<darkSignalNonUniformity>response of a detector element if no visible or infrared
light is present</darkSignalNonUniformity>
<errorTypeDarkSignalNonUniformity>standardDeviation</errorTypeDarkSignalNonUniformity>
<errorDarkSignalNonUniformity>0.0</errorDarkSignalNonUniformity>
<defectPixels>
    <CA_DefectPixels>
        <row>0</row>
        <column>0</column>
    </CA_DefectPixels>
</defectPixels>
<defectPixelsBrightImage>
    <CA_DefectPixelsBrightImage>
        <rowDefectPixelsBrightImage>0</rowDefectPixelsBrightImage>
        <columnDefectPixelsBrightImage>0</columnDefectPixelsBrightImage>
```

```
            </CA_DefectPixelsBrightImage>
        </defectPixelsBrightImage>
        <defectPixelsDarkImage>
            <CA_DefectPixelsDarkImage>
                <rowDefectPixelsDarkImage>0</rowDefectPixelsDarkImage>
                <columnDefectPixelsDarkImage>0</columnDefectPixelsDarkImage>
            </CA_DefectPixelsDarkImage>
        </defectPixelsDarkImage>
        <artefacts>description of other deficiencies of the detector</artefacts>
    </CA_ElectronicCell>
    <CA_GeometricPreCorrection>
        <polynomialDegree>0</polynomialDegree>
        <polynomialCoefficients>0.0</polynomialCoefficients>
        <resamplingDateCA_GeometricPreCorrection>1-09-2015
        12:00:00</resamplingDateCA_GeometricPreCorrection>
        <parametersCA_GeometricPreCorrection>0.0</parametersCA_GeometricPreCorrection>
    </CA_GeometricPreCorrection>
    <CA_GeometricResolution>
        <geometricResolution>0.0</geometricResolution>
    </CA_GeometricResolution>
    <CA_GeometricTarget>
        <calibrationType>laboratory</calibrationType>
        <sizeCA_GeometricTarget uom="#m">0.0</sizeCA_GeometricTarget>
        <descriptionCA_GeometricTarget>free text description of the
        target</descriptionCA_GeometricTarget>
        <typeCA_GeometricTarget>airforcePattern</typeCA_GeometricTarget>
        <material>awning</material>
        <paintType>characteristics of the paint</paintType>
        <reflectanceProperties>peculiarity of the reflectance</reflectanceProperties>
    </CA_GeometricTarget>
    <CA_GeometryValidation>
        <calibrationType>laboratory</calibrationType>
        <validationMethod>testfield</validationMethod>
        <validationTimeCA_GeometryValidation>0-0-0
        00:00:00</validationTimeCA_GeometryValidation>
    </CA_GeometryValidation>
    <CA_GNSS>
        <calibrationType>laboratory</calibrationType>
        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>
        <geometryCalibrationType>more detailed explanation of the the calibration
        type</geometryCalibrationType>
        <synchronizationCA_GNSS>0-0-0 00:00:00</synchronizationCA_GNSS>
        <synchronizationErrorCA_GNSS>0-0-0 00:00:00</synchronizationErrorCA_GNSS>
        <referenceTemperatureCA_GNSS>
            <CA_TemperatureCA_GNSS>
                <temperatureCA_GNSS>0.0</temperatureCA_GNSS>
            </CA_TemperatureCA_GNSS>
        </referenceTemperatureCA_GNSS>
        <versionFirmwareCA_GNSS>note about the firmware version</versionFirmwareCA_GNSS>
        <versionHardwareCA_GNSS>note about the hardware version</versionHardwareCA_GNSS>
        <timeLeverarmCA_GNSS>0-0-0 00:00:00</timeLeverarmCA_GNSS>
        <leverarmCA_GNSS>0.0</leverarmCA_GNSS>
        <errorLeverarmCA_GNSS uom="#m">0.0</errorLeverarmCA_GNSS>
        <numberSatellites>4</numberSatellites>
        <registrationCycle>0-0-0 00:00:00</registrationCycle>
    </CA_GNSS>
    <CA_IMU>
        <calibrationType>laboratory</calibrationType>
        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>
        <geometryCalibrationType>more detailed explanation of the the calibration
        type</geometryCalibrationType>
        <synchronizationCA_IMU>0-0-0 00:00:00</synchronizationCA_IMU>
        <synchronizationErrorCA_IMU>0-0-0 00:00:00</synchronizationErrorCA_IMU>
        <referenceTemperatureCA_IMU>
            <CA_TemperatureCA_IMU>
                <temperatureCA_IMU>0.0</temperatureCA_IMU>
            </CA_TemperatureCA_IMU>
```

```
        </referenceTemperatureCA_IMU>
        <versionFirmwareCA_IMU>note about the firmware version</versionFirmwareCA_IMU>
        <versionHardwareCA_IMU>note about the hardware version</versionHardwareCA_IMU>
        <timeLeverarmCA_IMU>0-0-0 00:00:00</timeLeverarmCA_IMU>
        <leverarmCA_IMU>0.0</leverarmCA_IMU>
        <errorLeverarmCA_IMU uom="#m">0.0</errorLeverarmCA_IMU>
        <boresightAngle>
            <SD_AttitudeCA_IMU>
                <angleAttitudeCA_IMU>
                    <SD_AngleAttitudeCA_IMU>
                        <rotatedAxesCA_IMU>yes</rotatedAxesCA_IMU>
                        <rotationAngleXCA_IMU uom="#m">0.0</rotationAngleXCA_IMU>
                        <rotationAngleYCA_IMU uom="#m">0.0</rotationAngleYCA_IMU>
                        <rotationAngleZCA_IMU uom="#m">0.0</rotationAngleZCA_IMU>
                        <rotationSequenceCA_IMU>XYZ</rotationSequenceCA_IMU>
                    </SD_AngleAttitudeCA_IMU>
                </angleAttitudeCA_IMU>
                <matrixAttitudeCA_IMU>
                    <SD_MatrixAttitudeCA_IMU>
                        <matrixElements1CA_IMU>0.0</matrixElements1CA_IMU>
                        <matrixElements2CA_IMU>0.0</matrixElements2CA_IMU>
                        <matrixElements3CA_IMU>0.0</matrixElements3CA_IMU>
                        <matrixElements4CA_IMU>0.0</matrixElements4CA_IMU>
                        <matrixElements5CA_IMU>0.0</matrixElements5CA_IMU>
                        <matrixElements6CA_IMU>0.0</matrixElements6CA_IMU>
                        <matrixElements7CA_IMU>0.0</matrixElements7CA_IMU>
                        <matrixElements8CA_IMU>0.0</matrixElements8CA_IMU>
                        <matrixElements9CA_IMU>0.0</matrixElements9CA_IMU>
                    </SD_MatrixAttitudeCA_IMU>
                </matrixAttitudeCA_IMU>
            </SD_AttitudeCA_IMU>
        </boresightAngle>
        <dataRate>0-0-0 00:00:00</dataRate>
        <attitudeAccuracy uom="#m">0.0</attitudeAccuracy>
    </CA_IMU>
    <CA_InFlight>
        <calibrationType>laboratory</calibrationType>
    </CA_InFlight>
    <CA_InteriorOrientation>
        <calibrationType>laboratory</calibrationType>
        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>
        <geometryCalibrationType>more detailed explanation of the the calibration
        type</geometryCalibrationType>
        <synchronizationCA_InteriorOrientation>0-0-0
        00:00:00</synchronizationCA_InteriorOrientation>
        <synchronizationErrorCA_InteriorOrientation>0-0-0
        00:00:00</synchronizationErrorCA_InteriorOrientation>
        <referenceTemperatureCA_InteriorOrientation>
            <CA_TemperatureCA_InteriorOrientation>
                <temperatureCA_InteriorOrientation>0.0</temperatureCA_InteriorOrientation>
            </CA_TemperatureCA_InteriorOrientation>
        </referenceTemperatureCA_InteriorOrientation>
        <versionFirmwareCA_InteriorOrientation>note about the firmware
        version</versionFirmwareCA_InteriorOrientation>
        <versionHardwareCA_InteriorOrientation>note about the hardware
        version</versionHardwareCA_InteriorOrientation>
    </CA_InteriorOrientation>
    <CA_JacobsenParameters>
        <j1>0.0</j1>
        <j2>0.0</j2>
        <j3>0.0</j3>
        <j4>0.0</j4>
        <j5>0.0</j5>
        <j6>0.0</j6>
        <j7>0.0</j7>
        <j8>0.0</j8>
        <j9>0.0</j9>
```

```
        <j10>0.0</j10>
        <j11>0.0</j11>
        <j12>0.0</j12>
        <j13>0.0</j13>
        <j14>0.0</j14>
        <j15>0.0</j15>
    </CA_JacobsenParameters>
    <CA_Laboratory>
        <calibrationType>laboratory</calibrationType>
        <calibrationInstrument>calibrationCage</calibrationInstrument>
        <pointSuspension>cage</pointSuspension>
    </CA_Laboratory>
    <CA_Linearity>
        <channelIdentification>alpha-numerical identification for the
        channel</channelIdentification>
        <receivedIntensity>0.0</receivedIntensity>
        <recordedIntensity>0.0</recordedIntensity>
    </CA_Linearity>
    <CA_LUT>
        <identification>Characterization of the LUT</identification>
        <in>0</in>
        <out>0</out>
    </CA_LUT>
    <CA_MeasuredReflectance>
        <intensity>0.0</intensity>
        <wavelengthCA_MeasuredReflectance uom="#m">0.0</wavelengthCA_MeasuredReflectance>
        <zenithAngle uom="#m">0.0</zenithAngle>
        <azimuth uom="#m">0.0</azimuth>
    </CA_MeasuredReflectance>
    <CA_ObjectToObject>
        <calibrationType>laboratory</calibrationType>
        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
        <lampType>type of illumination used</lampType>
        <atmosphericConditionCA_RadiometryInFlight>state of the
        atmosphere</atmosphericConditionCA_RadiometryInFlight>
        <aerosolQuantity>0.0</aerosolQuantity>
        <numberImages>0</numberImages>
        <rmse>0.0</rmse>
    </CA_ObjectToObject>
    <CA_OpticalFilters>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
                        <alternateTitleCA_RadiometryInSensor>short name or other language
                        name by which the cited information is
                        known</alternateTitleCA_RadiometryInSensor>
                        <dateCA_RadiometryInSensor>
                            <CI_DateCA_RadiometryInSensor>

                                <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                                diometryInSensor>

                                <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                                InSensor>
```

```
            </CI_DateCA_RadiometryInSensor>
        </dateCA_RadiometryInSensor>
        <editionCA_RadiometryInSensor>version of the cited
        resource</editionCA_RadiometryInSensor>
        <editionDateCA_RadiometryInSensor>

            <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
            A_RadiometryInSensor>
        </editionDateCA_RadiometryInSensor>
        <identifierCA_RadiometryInSensor>
            <MD_IdentifierCA_RadiometryInSensor>
                <authorityCA_RadiometryInSensor>person or party responsible
                for maintenance of the
                namespace</authorityCA_RadiometryInSensor>
                <codeCA_RadiometryInSensor>alphanumeric value identifying an
                instance in the namespace</codeCA_RadiometryInSensor>
            </MD_IdentifierCA_RadiometryInSensor>
        </identifierCA_RadiometryInSensor>
        <citedResponsiblePartyCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor>
                <individualNameCA_RadiometryInSensor>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor>
                <organisationNameCA_RadiometryInSensor>name of the
                responsible
                organization</organisationNameCA_RadiometryInSensor>
                <positionNameCA_RadiometryInSensor>role or position of the
                responsible person</positionNameCA_RadiometryInSensor>
                <contactInfoCA_RadiometryInSensor>
                    <CI_ContactCA_RadiometryInSensor>
                        <phoneCA_RadiometryInSensor>
                            <CI_TelephoneCA_RadiometryInSensor>
                                <voiceCA_RadiometryInSensor>telephone number
                                by which individuals can speak to the
                                responsible organization or
                                individual</voiceCA_RadiometryInSensor>
                                <facsimileCA_RadiometryInSensor>telephone
                                number of a facsimile machine for the
                                responsible organization or
                                individual</facsimileCA_RadiometryInSensor>
                            </CI_TelephoneCA_RadiometryInSensor>
                        </phoneCA_RadiometryInSensor>
                        <addressCA_RadiometryInSensor>
                            <CI_AddressCA_RadiometryInSensor>
                                <deliveryPointCA_RadiometryInSensor>address
                                line for the
                                location</deliveryPointCA_RadiometryInSensor>
                                <cityCA_RadiometryInSensor>city of the
                                location</cityCA_RadiometryInSensor>

                                <administrativeAreaCA_RadiometryInSensor>state
                                , province of the
                                location</administrativeAreaCA_RadiometryInSen
                                sor>
                                <postalCodeCA_RadiometryInSensor>ZIP or
                                other postal
                                code</postalCodeCA_RadiometryInSensor>
                                <countryCA_RadiometryInSensor>country of the
                                physical
                                address</countryCA_RadiometryInSensor>

                                <electronicMailAddressCA_RadiometryInSensor>te
                                lephone number of a facsimile machine for
                                the responsible organization or
                                individual</electronicMailAddressCA_Radiometry
                                InSensor>
                            </CI_AddressCA_RadiometryInSensor>
```

```
                        </addressCA_RadiometryInSensor>
                        <onlineResourceCA_RadiometryInSensor>
                            <CI_OnlineResourceCA_RadiometryInSensor>
                                <linkageCA_RadiometryInSensor>location
                                (address) for on-line access using a Uniform
                                Resource Locator address or similar
                                addressing
                                scheme</linkageCA_RadiometryInSensor>
                                <protocolCA_RadiometryInSensor>connection
                                protocol to be
                                used</protocolCA_RadiometryInSensor>

                                <applicationProfileCA_RadiometryInSensor>name
                                of an application profile that can be used
                                with the online
                                resource</applicationProfileCA_RadiometryInSen
                                sor>

                                <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                me of the online
                                resource</nameCI_OnlineResourceCA_RadiometryIn
                                Sensor>

                                <descriptionCI_OnlineResourceCA_RadiometryInSe
                                nsor>detailed text description of what the
                                online resource
                                is/does</descriptionCI_OnlineResourceCA_Radiom
                                etryInSensor>

                                <functionCA_RadiometryInSensor>download</funct
                                ionCA_RadiometryInSensor>
                            </CI_OnlineResourceCA_RadiometryInSensor>
                        </onlineResourceCA_RadiometryInSensor>
                        <hoursOfServiceCA_RadiometryInSensor>time period
                        (including time zone) when individuals can contact
                        the organization or
                        individual</hoursOfServiceCA_RadiometryInSensor>

                        <contactInstructionsCA_RadiometryInSensor>supplemental
                         instructions on how or when to contact the
                        individual or
                        organization</contactInstructionsCA_RadiometryInSensor
                        >
                    </CI_ContactCA_RadiometryInSensor>
                </contactInfoCA_RadiometryInSensor>

                <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                InSensor>
            </CI_ResponsiblePartyCA_RadiometryInSensor>
        </citedResponsiblePartyCA_RadiometryInSensor>

        <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
        rmCA_RadiometryInSensor>
        <seriesCA_RadiometryInSensor>
            <CI_SeriesCA_RadiometryInSensor>
                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                aggregate dataset, of which the dataset is a
                part</nameCI_SeriesCA_RadiometryInSensor>
                <issueIdentificationCA_RadiometryInSensor>information
                identifying the issue of the
                series</issueIdentificationCA_RadiometryInSensor>
                <pageCA_RadiometryInSensor>details on which pages of the
                publication the article was
                published</pageCA_RadiometryInSensor>
            </CI_SeriesCA_RadiometryInSensor>
        </seriesCA_RadiometryInSensor>
        <otherCitationDetailsCA_RadiometryInSensor>other information
```

```
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_RadiometryInSensor
                                1>
                            </CI_AddressCA_RadiometryInSensor1>
                        </addressCA_RadiometryInSensor1>
                        <onlineResourceCA_RadiometryInSensor1>
                            <CI_OnlineResourceCA_RadiometryInSensor1>
                                <linkageCA_RadiometryInSensor1>location (address)
                                for on-line access using a Uniform Resource Locator
                                address or similar addressing
                                scheme</linkageCA_RadiometryInSensor1>
                                <protocolCA_RadiometryInSensor1>connection protocol
```

```
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <spectralCharacteristicsCA_OpticalFilters>
        <CA_SpectrumCA_OpticalFilters>
            <numberBandsCA_OpticalFilters>0</numberBandsCA_OpticalFilters>
            <wavelengthCA_SpectrumCA_OpticalFilters
            uom="#m">0.0</wavelengthCA_SpectrumCA_OpticalFilters>
            <responseCA_OpticalFilters>0.0</responseCA_OpticalFilters>
        </CA_SpectrumCA_OpticalFilters>
    </spectralCharacteristicsCA_OpticalFilters>
</CA_OpticalFilters>
<CA_OpticalSensors>
    <calibrationType>laboratory</calibrationType>
</CA_OpticalSensors>
<CA_OpticalSystem>
    <calibratedFocalLength uom="#m">0.0</calibratedFocalLength>
    <qualityOfCalibratedFocalLength>
        <DQ_QuantitativeAttributeAccuracySD_OpticalSystem>
            <standaloneQualityReportDetailsSD_OpticalSystem>description of the data
            quality element</standaloneQualityReportDetailsSD_OpticalSystem>
        </DQ_QuantitativeAttributeAccuracySD_OpticalSystem>
    </qualityOfCalibratedFocalLength>
    <principPointAutocoll>0.0</principPointAutocoll>
    <covPrincPtAutocoll>
        <DQ_PositionalAccuracySD_OpticalSystem1>
            <standaloneQualityReportDetailsSD_OpticalSystem1>description of the data
            quality element</standaloneQualityReportDetailsSD_OpticalSystem1>
        </DQ_PositionalAccuracySD_OpticalSystem1>
    </covPrincPtAutocoll>
    <resolvingPower>
        <CA_GeometricResolutionCA_OpticalSystem>
            <geometricResolutionCA_OpticalSystem>0.0</geometricResolutionCA_OpticalSystem>
        </CA_GeometricResolutionCA_OpticalSystem>
    </resolvingPower>
    <virtualFocalLength uom="#m">0.0</virtualFocalLength>
    <virtualSensorSize uom="#m">0.0</virtualSensorSize>
    <virtualPixelSize uom="#m">0.0</virtualPixelSize>
```

```
        <virtualPrinciplePointAutocoll>0.0</virtualPrinciplePointAutocoll>
    </CA_OpticalSystem>
    <CA_Optics>
        <cameraHead>description of the respective camera head</cameraHead>
        <channel>description of the available spectral channels</channel>
    </CA_Optics>
    <CA_OpticsFacilityGeometry>
        <calibrationType>laboratory</calibrationType>
    </CA_OpticsFacilityGeometry>
    <CA_OpticsFacilityRadiometry>
        <calibrationType>laboratory</calibrationType>
        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
    </CA_OpticsFacilityRadiometry>
    <CA_OpticsSensorGeometry>
        <calibrationType>laboratory</calibrationType>
        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>
        <geometryCalibrationType>more detailed explanation of the calibration
        type</geometryCalibrationType>
    </CA_OpticsSensorGeometry>
    <CA_OpticsSensorRadiometry>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
    </CA_OpticsSensorRadiometry>
    <CA_OpticsValidation>
        <calibrationType>laboratory</calibrationType>
    </CA_OpticsValidation>
    <CA_OptoElectronicSystem>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
                        <alternateTitleCA_RadiometryInSensor>short name or other language
                        name by which the cited information is
                        known</alternateTitleCA_RadiometryInSensor>
                        <dateCA_RadiometryInSensor>
                            <CI_DateCA_RadiometryInSensor>

                                <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                                diometryInSensor>

                                <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                                InSensor>
                            </CI_DateCA_RadiometryInSensor>
                        </dateCA_RadiometryInSensor>
                        <editionCA_RadiometryInSensor>version of the cited
                        resource</editionCA_RadiometryInSensor>
                        <editionDateCA_RadiometryInSensor>
```

```
                <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
                A_RadiometryInSensor>
            </editionDateCA_RadiometryInSensor>
            <identifierCA_RadiometryInSensor>
                <MD_IdentifierCA_RadiometryInSensor>
                    <authorityCA_RadiometryInSensor>person or party responsible
                    for maintenance of the
                    namespace</authorityCA_RadiometryInSensor>
                    <codeCA_RadiometryInSensor>alphanumeric value identifying an
                    instance in the namespace</codeCA_RadiometryInSensor>
                </MD_IdentifierCA_RadiometryInSensor>
            </identifierCA_RadiometryInSensor>
            <citedResponsiblePartyCA_RadiometryInSensor>
                <CI_ResponsiblePartyCA_RadiometryInSensor>
                    <individualNameCA_RadiometryInSensor>name of the responsible
                    person- surname,given name, title separated by a
                    delimiter</individualNameCA_RadiometryInSensor>
                    <organisationNameCA_RadiometryInSensor>name of the
                    responsible
                    organization</organisationNameCA_RadiometryInSensor>
                    <positionNameCA_RadiometryInSensor>role or position of the
                    responsible person</positionNameCA_RadiometryInSensor>
                    <contactInfoCA_RadiometryInSensor>
                        <CI_ContactCA_RadiometryInSensor>
                            <phoneCA_RadiometryInSensor>
                                <CI_TelephoneCA_RadiometryInSensor>
                                    <voiceCA_RadiometryInSensor>telephone number
                                    by which individuals can speak to the
                                    responsible organization or
                                    individual</voiceCA_RadiometryInSensor>
                                    <facsimileCA_RadiometryInSensor>telephone
                                    number of a facsimile machine for the
                                    responsible organization or
                                    individual</facsimileCA_RadiometryInSensor>
                                </CI_TelephoneCA_RadiometryInSensor>
                            </phoneCA_RadiometryInSensor>
                            <addressCA_RadiometryInSensor>
                                <CI_AddressCA_RadiometryInSensor>
                                    <deliveryPointCA_RadiometryInSensor>address
                                    line for the
                                    location</deliveryPointCA_RadiometryInSensor>
                                    <cityCA_RadiometryInSensor>city of the
                                    location</cityCA_RadiometryInSensor>

                                    <administrativeAreaCA_RadiometryInSensor>state
                                    , province of the
                                    location</administrativeAreaCA_RadiometryInSen
                                    sor>
                                    <postalCodeCA_RadiometryInSensor>ZIP or
                                    other postal
                                    code</postalCodeCA_RadiometryInSensor>
                                    <countryCA_RadiometryInSensor>country of the
                                    physical
                                    address</countryCA_RadiometryInSensor>

                                    <electronicMailAddressCA_RadiometryInSensor>te
                                    lephone number of a facsimile machine for
                                    the responsible organization or
                                    individual</electronicMailAddressCA_Radiometry
                                    InSensor>
                                </CI_AddressCA_RadiometryInSensor>
                            </addressCA_RadiometryInSensor>
                            <onlineResourceCA_RadiometryInSensor>
                                <CI_OnlineResourceCA_RadiometryInSensor>
                                    <linkageCA_RadiometryInSensor>location
                                    (address) for on-line access using a Uniform
```

```
                                        Resource Locator address or similar
                                        addressing
                                        scheme</linkageCA_RadiometryInSensor>
                                        <protocolCA_RadiometryInSensor>connection
                                        protocol to be
                                        used</protocolCA_RadiometryInSensor>

                                        <applicationProfileCA_RadiometryInSensor>name
                                        of an application profile that can be used
                                        with the online
                                        resource</applicationProfileCA_RadiometryInSen
                                        sor>

                                        <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                        me of the online
                                        resource</nameCI_OnlineResourceCA_RadiometryIn
                                        Sensor>

                                        <descriptionCI_OnlineResourceCA_RadiometryInSe
                                        nsor>detailed text description of what the
                                        online resource
                                        is/does</descriptionCI_OnlineResourceCA_Radiom
                                        etryInSensor>

                                        <functionCA_RadiometryInSensor>download</funct
                                        ionCA_RadiometryInSensor>
                                    </CI_OnlineResourceCA_RadiometryInSensor>
                                </onlineResourceCA_RadiometryInSensor>
                                <hoursOfServiceCA_RadiometryInSensor>time period
                                (including time zone) when individuals can contact
                                the organization or
                                individual</hoursOfServiceCA_RadiometryInSensor>

                                <contactInstructionsCA_RadiometryInSensor>supplemental
                                 instructions on how or when to contact the
                                individual or
                                organization</contactInstructionsCA_RadiometryInSensor
                                >
                            </CI_ContactCA_RadiometryInSensor>
                        </contactInfoCA_RadiometryInSensor>

                        <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                        InSensor>
                    </CI_ResponsiblePartyCA_RadiometryInSensor>
                </citedResponsiblePartyCA_RadiometryInSensor>

                <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
                rmCA_RadiometryInSensor>
                <seriesCA_RadiometryInSensor>
                    <CI_SeriesCA_RadiometryInSensor>
                        <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryInSensor>
                        <issueIdentificationCA_RadiometryInSensor>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
```

```
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_RadiometryInSensor
                                1>
                            </CI_AddressCA_RadiometryInSensor1>
                        </addressCA_RadiometryInSensor1>
                        <onlineResourceCA_RadiometryInSensor1>
                            <CI_OnlineResourceCA_RadiometryInSensor1>
                                <linkageCA_RadiometryInSensor1>location (address)
                                for on-line access using a Uniform Resource Locator
                                address or similar addressing
                                scheme</linkageCA_RadiometryInSensor1>
                                <protocolCA_RadiometryInSensor1>connection protocol
                                to be used</protocolCA_RadiometryInSensor1>
                                <applicationProfileCA_RadiometryInSensor1>name of an
                                application profile that can be used with the online
                                resource</applicationProfileCA_RadiometryInSensor1>
                                <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
```

```
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
</CA_OptoElectronicSystem>
<CA_PhotoFlight>
    <numberOfPhotoFlights>0</numberOfPhotoFlights>
    <photoScale>0.0</photoScale>
    <flyingHeight uom="#m">0.0</flyingHeight>
    <flyingAltitudeAboveGround uom="#m">0.0</flyingAltitudeAboveGround>
    <terrainHeight uom="">0.0</terrainHeight>
    <alongStripOverlap>0.0</alongStripOverlap>
    <acrossStripOverlap>0.0</acrossStripOverlap>
    <base uom="#m">0.0</base>
    <numberOfPhotos>0</numberOfPhotos>
    <numberOfStrips>0</numberOfStrips>
    <numberOfPhotosAlongStrip>0</numberOfPhotosAlongStrip>
    <numberOfPhotosUsed>0</numberOfPhotosUsed>
</CA_PhotoFlight>
<CA_PointSpreadFunction>
    <shapeCA_PointSpreadFunction>square</shapeCA_PointSpreadFunction>
    <spreading>characteristic parameters or as a discrete function</spreading>
</CA_PointSpreadFunction>
<CA_PositionalError>
    <errorXCA_PositionalError uom="#m">0.0</errorXCA_PositionalError>
    <errorYCA_PositionalError uom="#m">0.0</errorYCA_PositionalError>
    <errorZCA_PositionalError uom="#m">0.0</errorZCA_PositionalError>
    <errorXYCA_PositionalError uom="#m">0.0</errorXYCA_PositionalError>
    <errorXYZCA_PositionalError uom="#m">0.0</errorXYZCA_PositionalError>
    <pointTypeCA_PositionalError>controlPoint</pointTypeCA_PositionalError>
    <errorTypeCA_PositionalError>standardDeviation</errorTypeCA_PositionalError>
    <quantityTypeCA_PositionalError>minimum</quantityTypeCA_PositionalError>
</CA_PositionalError>
<CA_RadialDistortion>
    <numberCoefficients>0</numberCoefficients>
    <k>0.0</k>
</CA_RadialDistortion>
<CA_Radiation>
    <solarZenithAngle uom="#m">0.0</solarZenithAngle>
    <solarAzimuth uom="#m">0.0</solarAzimuth>
    <atmosphericConditionCA_Radiation>general description of the status of the
    atmosphere during the calibration</atmosphericConditionCA_Radiation>
    <atmosphericModelCA_Radiation>characterization of the atmospheric
```

```
model</atmosphericModelCA_Radiation>
<modelType>
    <CI_CitationCA_Radiation>
        <titleCA_Radiation>name by which the cited resource is
        known</titleCA_Radiation>
        <alternateTitleCA_Radiation>short name or other language name by which the
        cited information is known</alternateTitleCA_Radiation>
        <dateCA_Radiation>
            <CI_DateCA_Radiation>
                <dateCI_DateCA_Radiation>01-09-2015</dateCI_DateCA_Radiation>
                <dateTypeCA_Radiation>creation</dateTypeCA_Radiation>
            </CI_DateCA_Radiation>
        </dateCA_Radiation>
        <editionCA_Radiation>version of the cited resource</editionCA_Radiation>
        <editionDateCA_Radiation>
            <dateEditionDateCA_Radiation>01-09-2015</dateEditionDateCA_Radiation>
        </editionDateCA_Radiation>
        <identifierCA_Radiation>
            <MD_IdentifierCA_Radiation>
                <authorityCA_Radiation>person or party responsible for maintenance
                of the namespace</authorityCA_Radiation>
                <codeCA_Radiation>alphanumeric value identifying an instance in the
                namespace</codeCA_Radiation>
            </MD_IdentifierCA_Radiation>
        </identifierCA_Radiation>
        <citedResponsiblePartyCA_Radiation>
            <CI_ResponsiblePartyCA_Radiation>
                <individualNameCA_Radiation>name of the responsible person-
                surname,given name, title separated by a
                delimiter</individualNameCA_Radiation>
                <organisationNameCA_Radiation>name of the responsible
                organization</organisationNameCA_Radiation>
                <positionNameCA_Radiation>role or position of the responsible
                person</positionNameCA_Radiation>
                <contactInfoCA_Radiation>
                    <CI_ContactCA_Radiation>
                        <phoneCA_Radiation>
                            <CI_TelephoneCA_Radiation>
                                <voiceCA_Radiation>telephone number by which
                                individuals can speak to the responsible
                                organization or individual</voiceCA_Radiation>
                                <facsimileCA_Radiation>telephone number of a
                                facsimile machine for the responsible organization
                                or individual</facsimileCA_Radiation>
                            </CI_TelephoneCA_Radiation>
                        </phoneCA_Radiation>
                        <addressCA_Radiation>
                            <CI_AddressCA_Radiation>
                                <deliveryPointCA_Radiation>address line for the
                                location</deliveryPointCA_Radiation>
                                <cityCA_Radiation>city of the
                                location</cityCA_Radiation>
                                <administrativeAreaCA_Radiation>state, province of
                                the location</administrativeAreaCA_Radiation>
                                <postalCodeCA_Radiation>ZIP or other postal
                                code</postalCodeCA_Radiation>
                                <countryCA_Radiation>country of the physical
                                address</countryCA_Radiation>
                                <electronicMailAddressCA_Radiation>telephone number
                                of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_Radiation>
                            </CI_AddressCA_Radiation>
                        </addressCA_Radiation>
                        <onlineResourceCA_Radiation>
                            <CI_OnlineResourceCA_Radiation>
                                <linkageCA_Radiation>location (address) for on-line
```

```
                                    access using a Uniform Resource Locator address or
                                    similar addressing scheme</linkageCA_Radiation>
                                    <protocolCA_Radiation>connection protocol to be
                                    used</protocolCA_Radiation>
                                    <applicationProfileCA_Radiation>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_Radiation>
                                    <nameCI_OnlineResourceCA_Radiation>name of the
                                    online resource</nameCI_OnlineResourceCA_Radiation>
                                    <descriptionCI_OnlineResourceCA_Radiation>detailed
                                    text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Radiation>
                                    <functionCA_Radiation>download</functionCA_Radiation>
                                </CI_OnlineResourceCA_Radiation>
                            </onlineResourceCA_Radiation>
                            <hoursOfServiceCA_Radiation>time period (including time
                            zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_Radiation>
                            <contactInstructionsCA_Radiation>supplemental instructions
                            on how or when to contact the individual or
                            organization</contactInstructionsCA_Radiation>
                        </CI_ContactCA_Radiation>
                    </contactInfoCA_Radiation>
                    <roleCA_Radiation>resourceProvider</roleCA_Radiation>
                </CI_ResponsiblePartyCA_Radiation>
            </citedResponsiblePartyCA_Radiation>
            <presentationFormCA_Radiation>documentDigital</presentationFormCA_Radiation>
            <seriesCA_Radiation>
                <CI_SeriesCA_Radiation>
                    <nameCI_SeriesCA_Radiation>name of the series, or aggregate dataset,
                    of which the dataset is a part</nameCI_SeriesCA_Radiation>
                    <issueIdentificationCA_Radiation>information identifying the issue
                    of the series</issueIdentificationCA_Radiation>
                    <pageCA_Radiation>details on which pages of the publication the
                    article was published</pageCA_Radiation>
                </CI_SeriesCA_Radiation>
            </seriesCA_Radiation>
            <otherCitationDetailsCA_Radiation>other information required to complete the
            citation that is not recorded elsewhere</otherCitationDetailsCA_Radiation>
            <collectiveTitleCA_Radiation>common title with holdings
            note</collectiveTitleCA_Radiation>
            <ISBNCA_Radiation>international Standard Book Number</ISBNCA_Radiation>
            <ISSNCA_Radiation>international Standard Serial Number</ISSNCA_Radiation>
        </CI_CitationCA_Radiation>
    </modelType>
    <solarIncidentAngle uom="#m">0.0</solarIncidentAngle>
    <solarIrradiance>smith_and_gottlieb_1974</solarIrradiance>
</CA_Radiation>
<CA_RadiometricDynamics>
    <bit>1</bit>
</CA_RadiometricDynamics>
<CA_RadiometryInFlight>
    <calibrationType>laboratory</calibrationType>
    <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
    <lampType>type of illumination used</lampType>
    <atmosphericConditionCA_RadiometryInFlight>state of the
    atmosphere</atmosphericConditionCA_RadiometryInFlight>
    <aerosolQuantity>0.0</aerosolQuantity>
</CA_RadiometryInFlight>
<CA_RadiometryInSensor>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
```

```
<maxWavelength>0.0</maxWavelength>
<b>0.0</b>
<c>0.0</c>
<sensorSystemIdentification>
    <MD_IdentificationCA_RadiometryInSensor>
        <citationCA_RadiometryInSensor>
            <CI_CitationCA_RadiometryInSensor>
                <titleCA_RadiometryInSensor>name by which the cited resource is
                known</titleCA_RadiometryInSensor>
                <alternateTitleCA_RadiometryInSensor>short name or other language
                name by which the cited information is
                known</alternateTitleCA_RadiometryInSensor>
                <dateCA_RadiometryInSensor>
                    <CI_DateCA_RadiometryInSensor>

                        <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                        diometryInSensor>

                        <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                        InSensor>
                    </CI_DateCA_RadiometryInSensor>
                </dateCA_RadiometryInSensor>
                <editionCA_RadiometryInSensor>version of the cited
                resource</editionCA_RadiometryInSensor>
                <editionDateCA_RadiometryInSensor>

                    <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
                    A_RadiometryInSensor>
                </editionDateCA_RadiometryInSensor>
                <identifierCA_RadiometryInSensor>
                    <MD_IdentifierCA_RadiometryInSensor>
                        <authorityCA_RadiometryInSensor>person or party responsible
                        for maintenance of the
                        namespace</authorityCA_RadiometryInSensor>
                        <codeCA_RadiometryInSensor>alphanumeric value identifying an
                        instance in the namespace</codeCA_RadiometryInSensor>
                    </MD_IdentifierCA_RadiometryInSensor>
                </identifierCA_RadiometryInSensor>
                <citedResponsiblePartyCA_RadiometryInSensor>
                    <CI_ResponsiblePartyCA_RadiometryInSensor>
                        <individualNameCA_RadiometryInSensor>name of the responsible
                        person- surname,given name, title separated by a
                        delimiter</individualNameCA_RadiometryInSensor>
                        <organisationNameCA_RadiometryInSensor>name of the
                        responsible
                        organization</organisationNameCA_RadiometryInSensor>
                        <positionNameCA_RadiometryInSensor>role or position of the
                        responsible person</positionNameCA_RadiometryInSensor>
                        <contactInfoCA_RadiometryInSensor>
                            <CI_ContactCA_RadiometryInSensor>
                                <phoneCA_RadiometryInSensor>
                                    <CI_TelephoneCA_RadiometryInSensor>
                                        <voiceCA_RadiometryInSensor>telephone number
                                        by which individuals can speak to the
                                        responsible organization or
                                        individual</voiceCA_RadiometryInSensor>
                                        <facsimileCA_RadiometryInSensor>telephone
                                        number of a facsimile machine for the
                                        responsible organization or
                                        individual</facsimileCA_RadiometryInSensor>
                                    </CI_TelephoneCA_RadiometryInSensor>
                                </phoneCA_RadiometryInSensor>
                                <addressCA_RadiometryInSensor>
                                    <CI_AddressCA_RadiometryInSensor>
                                        <deliveryPointCA_RadiometryInSensor>address
                                        line for the
                                        location</deliveryPointCA_RadiometryInSensor>
```

```
                                <cityCA_RadiometryInSensor>city of the
                                location</cityCA_RadiometryInSensor>

                                <administrativeAreaCA_RadiometryInSensor>state
                                , province of the
                                location</administrativeAreaCA_RadiometryInSen
                                sor>
                                <postalCodeCA_RadiometryInSensor>ZIP or
                                other postal
                                code</postalCodeCA_RadiometryInSensor>
                                <countryCA_RadiometryInSensor>country of the
                                physical
                                address</countryCA_RadiometryInSensor>

                                <electronicMailAddressCA_RadiometryInSensor>te
                                lephone number of a facsimile machine for
                                the responsible organization or
                                individual</electronicMailAddressCA_Radiometry
                                InSensor>
                            </CI_AddressCA_RadiometryInSensor>
                        </addressCA_RadiometryInSensor>
                        <onlineResourceCA_RadiometryInSensor>
                            <CI_OnlineResourceCA_RadiometryInSensor>
                                <linkageCA_RadiometryInSensor>location
                                (address) for on-line access using a Uniform
                                Resource Locator address or similar
                                addressing
                                scheme</linkageCA_RadiometryInSensor>
                                <protocolCA_RadiometryInSensor>connection
                                protocol to be
                                used</protocolCA_RadiometryInSensor>

                                <applicationProfileCA_RadiometryInSensor>name
                                of an application profile that can be used
                                with the online
                                resource</applicationProfileCA_RadiometryInSen
                                sor>

                                <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                me of the online
                                resource</nameCI_OnlineResourceCA_RadiometryIn
                                Sensor>

                                <descriptionCI_OnlineResourceCA_RadiometryInSe
                                nsor>detailed text description of what the
                                online resource
                                is/does</descriptionCI_OnlineResourceCA_Radiom
                                etryInSensor>

                                <functionCA_RadiometryInSensor>download</funct
                                ionCA_RadiometryInSensor>
                            </CI_OnlineResourceCA_RadiometryInSensor>
                        </onlineResourceCA_RadiometryInSensor>
                        <hoursOfServiceCA_RadiometryInSensor>time period
                        (including time zone) when individuals can contact
                        the organization or
                        individual</hoursOfServiceCA_RadiometryInSensor>

                        <contactInstructionsCA_RadiometryInSensor>supplemental
                         instructions on how or when to contact the
                        individual or
                        organization</contactInstructionsCA_RadiometryInSensor
                        >
                    </CI_ContactCA_RadiometryInSensor>
                </contactInfoCA_RadiometryInSensor>

                <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
```

```
                    InSensor>
                </CI_ResponsiblePartyCA_RadiometryInSensor>
            </citedResponsiblePartyCA_RadiometryInSensor>

            <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
            rmCA_RadiometryInSensor>
            <seriesCA_RadiometryInSensor>
                <CI_SeriesCA_RadiometryInSensor>
                    <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                    aggregate dataset, of which the dataset is a
                    part</nameCI_SeriesCA_RadiometryInSensor>
                    <issueIdentificationCA_RadiometryInSensor>information
                    identifying the issue of the
                    series</issueIdentificationCA_RadiometryInSensor>
                    <pageCA_RadiometryInSensor>details on which pages of the
                    publication the article was
                    published</pageCA_RadiometryInSensor>
                </CI_SeriesCA_RadiometryInSensor>
            </seriesCA_RadiometryInSensor>
            <otherCitationDetailsCA_RadiometryInSensor>other information
            required to complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_RadiometryInSensor>
            <collectiveTitleCA_RadiometryInSensor>common title with holdings
            note</collectiveTitleCA_RadiometryInSensor>
            <ISBNCA_RadiometryInSensor>international Standard Book
            Number</ISBNCA_RadiometryInSensor>
            <ISSNCA_RadiometryInSensor>international Standard Serial
            Number</ISSNCA_RadiometryInSensor>
        </CI_CitationCA_RadiometryInSensor>
    </citationCA_RadiometryInSensor>
    <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
    resource(s)</abstractCA_RadiometryInSensor>
    <purposeCA_RadiometryInSensor>summary of the intentions with which the
    resource(s) was developed</purposeCA_RadiometryInSensor>
    <creditCA_RadiometryInSensor>recognition of those who contributed to the
    resource(s)</creditCA_RadiometryInSensor>
    <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
    <pointOfContactCA_RadiometryInSensor>
        <CI_ResponsiblePartyCA_RadiometryInSensor1>
            <individualNameCA_RadiometryInSensor1>name of the responsible
            person- surname,given name, title separated by a
            delimiter</individualNameCA_RadiometryInSensor1>
            <organisationNameCA_RadiometryInSensor1>name of the responsible
            organization</organisationNameCA_RadiometryInSensor1>
            <positionNameCA_RadiometryInSensor1>role or position of the
            responsible person</positionNameCA_RadiometryInSensor1>
            <contactInfoCA_RadiometryInSensor1>
                <CI_ContactCA_RadiometryInSensor1>
                    <phoneCA_RadiometryInSensor1>
                        <CI_TelephoneCA_RadiometryInSensor1>
                            <voiceCA_RadiometryInSensor1>telephone number by
                            which individuals can speak to the responsible
                            organization or
                            individual</voiceCA_RadiometryInSensor1>
                            <facsimileCA_RadiometryInSensor1>telephone number of
                            a facsimile machine for the responsible organization
                            or individual</facsimileCA_RadiometryInSensor1>
                        </CI_TelephoneCA_RadiometryInSensor1>
                    </phoneCA_RadiometryInSensor1>
                    <addressCA_RadiometryInSensor1>
                        <CI_AddressCA_RadiometryInSensor1>
                            <deliveryPointCA_RadiometryInSensor1>address line
                            for the location</deliveryPointCA_RadiometryInSensor1>
                            <cityCA_RadiometryInSensor1>city of the
                            location</cityCA_RadiometryInSensor1>
                            <administrativeAreaCA_RadiometryInSensor1>state,
                            province of the
```

```
                                    location</administrativeAreaCA_RadiometryInSensor1>
                                    <postalCodeCA_RadiometryInSensor1>ZIP or other
                                    postal code</postalCodeCA_RadiometryInSensor1>
                                    <countryCA_RadiometryInSensor1>country of the
                                    physical address</countryCA_RadiometryInSensor1>

                                    <electronicMailAddressCA_RadiometryInSensor1>telephone
                                     number of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor >
    </sensorSystemIdentification>
</CA_RadiometryInSensor>
<CA_RadiometryLaboratory>
    <calibrationType>laboratory</calibrationType>
    <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
    <calibrationMethod>integratingSphere</calibrationMethod>
</CA_RadiometryLaboratory>
<CA_RadiometryOffSensor>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
    <maxWavelength>0.0</maxWavelength>
```

```
        <b>0.0</b>
        <c>0.0</c>
        <atmosphericModelCA_RadiometryOffSensor>model that is applied for the atmospheric
        correction</atmosphericModelCA_RadiometryOffSensor>
        <modelProperties>general description of the atmospheric model</modelProperties>
        <method>darkPixelSubtractionMethod</method>
        <illumination>definition of the light conditions of the imaged object</illumination>
        <pathRadiance>0.0</pathRadiance>
        <backgroundRadiance>0.0</backgroundRadiance>
        <skylight>0.0</skylight>
        <skylightReflected>0.0</skylightReflected>
    </CA_RadiometryOffSensor>
    <CA_RadiometryPreCorrection>
        <resamplingDateCA_RadiometryPreCorrection>1-09-2015
        12:00:00</resamplingDateCA_RadiometryPreCorrection>
        <tonalAdjustmentType>gammaCorrection</tonalAdjustmentType>
        <gammaCorrection>0.0</gammaCorrection>
        <radiometricTransformation>16To8Bit</radiometricTransformation>
        <lookUpTable>
            <CA_LUT>
                <identification>Characterization of the LUT</identification>
                <in>0</in>
                <out>0</out>
            </CA_LUT>
        </lookUpTable>
        <filterType>
            <CI_CitationCA_RadiometryPreCorrection>
                <titleCA_RadiometryPreCorrection>name by which the cited resource is
                known</titleCA_RadiometryPreCorrection>
                <alternateTitleCA_RadiometryPreCorrection>short name or other language name
                by which the cited information is
                known</alternateTitleCA_RadiometryPreCorrection>
                <dateCA_RadiometryPreCorrection>
                    <CI_DateCA_RadiometryPreCorrection>

                        <dateCI_DateCA_RadiometryPreCorrection>1-09-2015</dateCI_DateCA_Radiom
                        etryPreCorrection>

                        <dateTypeCA_RadiometryPreCorrection>creation</dateTypeCA_RadiometryPre
                        Correction>
                    </CI_DateCA_RadiometryPreCorrection>
                </dateCA_RadiometryPreCorrection>
                <editionCA_RadiometryPreCorrection>version of the cited
                resource</editionCA_RadiometryPreCorrection>
                <editionDateCA_RadiometryPreCorrection>

                    <dateEditionDateCA_RadiometryPreCorrection>1-09-2015</dateEditionDateCA_Ra
                    diometryPreCorrection>
                </editionDateCA_RadiometryPreCorrection>
                <identifierCA_RadiometryPreCorrection>
                    <MD_IdentifierCA_RadiometryPreCorrection>
                        <authorityCA_RadiometryPreCorrection>person or party responsible for
                        maintenance of the namespace</authorityCA_RadiometryPreCorrection>
                        <codeCA_RadiometryPreCorrection>alphanumeric value identifying an
                        instance in the namespace</codeCA_RadiometryPreCorrection>
                    </MD_IdentifierCA_RadiometryPreCorrection>
                </identifierCA_RadiometryPreCorrection>
                <citedResponsiblePartyCA_RadiometryPreCorrection>
                    <CI_ResponsiblePartyCA_RadiometryPreCorrection>
                        <individualNameCA_RadiometryPreCorrection>name of the responsible
                        person- surname,given name, title separated by a
                        delimiter</individualNameCA_RadiometryPreCorrection>
                        <organisationNameCA_RadiometryPreCorrection>name of the responsible
                        organization</organisationNameCA_RadiometryPreCorrection>
                        <positionNameCA_RadiometryPreCorrection>role or position of the
                        responsible person</positionNameCA_RadiometryPreCorrection>
                        <contactInfoCA_RadiometryPreCorrection>
```

```
                    <CI_ContactCA_RadiometryPreCorrection>
                        <phoneCA_RadiometryPreCorrection>
                            <CI_TelephoneCA_RadiometryPreCorrection>
                                <voiceCA_RadiometryPreCorrection>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryPreCorrection>
                                <facsimileCA_RadiometryPreCorrection>telephone
                                number of a facsimile machine for the responsible
                                organization or
                                individual</facsimileCA_RadiometryPreCorrection>
                            </CI_TelephoneCA_RadiometryPreCorrection>
                        </phoneCA_RadiometryPreCorrection>
                        <addressCA_RadiometryPreCorrection>
                            <CI_AddressCA_RadiometryPreCorrection>
                                <deliveryPointCA_RadiometryPreCorrection>address
                                line for the
                                location</deliveryPointCA_RadiometryPreCorrection>
                                <cityCA_RadiometryPreCorrection>city of the
                                location</cityCA_RadiometryPreCorrection>
                                <administrativeAreaCA_RadiometryPreCorrection>state,
                                province of the
                                location</administrativeAreaCA_RadiometryPreCorrection
                                >
                                <postalCodeCA_RadiometryPreCorrection>ZIP or other
                                postal code</postalCodeCA_RadiometryPreCorrection>
                                <countryCA_RadiometryPreCorrection>country of the
                                physical address</countryCA_RadiometryPreCorrection>

                                <electronicMailAddressCA_RadiometryPreCorrection>telep
                                hone number of a facsimile machine for the
                                responsible organization or
                                individual</electronicMailAddressCA_RadiometryPreCorre
                                ction>
                            </CI_AddressCA_RadiometryPreCorrection>
                        </addressCA_RadiometryPreCorrection>
                        <onlineResourceCA_RadiometryPreCorrection>
                            <CI_OnlineResourceCA_RadiometryPreCorrection>
                                <linkageCA_RadiometryPreCorrection>location
                                (address) for on-line access using a Uniform
                                Resource Locator address or similar addressing
                                scheme</linkageCA_RadiometryPreCorrection>
                                <protocolCA_RadiometryPreCorrection>connection
                                protocol to be
                                used</protocolCA_RadiometryPreCorrection>
                                <applicationProfileCA_RadiometryPreCorrection>name
                                of an application profile that can be used with the
                                online
                                resource</applicationProfileCA_RadiometryPreCorrection
                                >

                                <nameCI_OnlineResourceCA_RadiometryPreCorrection>name
                                of the online
                                resource</nameCI_OnlineResourceCA_RadiometryPreCorrect
                                ion>

                                <descriptionCI_OnlineResourceCA_RadiometryPreCorrectio
                                n>detailed text description of what the online
                                resource
                                is/does</descriptionCI_OnlineResourceCA_RadiometryPreC
                                orrection>

                                <functionCA_RadiometryPreCorrection>download</function
                                CA_RadiometryPreCorrection>
                            </CI_OnlineResourceCA_RadiometryPreCorrection>
                        </onlineResourceCA_RadiometryPreCorrection>
                        <hoursOfServiceCA_RadiometryPreCorrection>time period
```

```
                                (including time zone) when individuals can contact the
                                organization or
                                individual</hoursOfServiceCA_RadiometryPreCorrection>
                                <contactInstructionsCA_RadiometryPreCorrection>supplemental
                                instructions on how or when to contact the individual or
                                organization</contactInstructionsCA_RadiometryPreCorrection>
                            </CI_ContactCA_RadiometryPreCorrection>
                        </contactInfoCA_RadiometryPreCorrection>

                        <roleCA_RadiometryPreCorrection>resourceProvider</roleCA_RadiometryPre
                        Correction>
                    </CI_ResponsiblePartyCA_RadiometryPreCorrection>
                </citedResponsiblePartyCA_RadiometryPreCorrection>

                <presentationFormCA_RadiometryPreCorrection>documentDigital</presentationFormC
                A_RadiometryPreCorrection>
                <seriesCA_RadiometryPreCorrection>
                    <CI_SeriesCA_RadiometryPreCorrection>
                        <nameCI_SeriesCA_RadiometryPreCorrection>name of the series, or
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryPreCorrection>
                        <issueIdentificationCA_RadiometryPreCorrection>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryPreCorrection>
                        <pageCA_RadiometryPreCorrection>details on which pages of the
                        publication the article was published</pageCA_RadiometryPreCorrection>
                    </CI_SeriesCA_RadiometryPreCorrection>
                </seriesCA_RadiometryPreCorrection>
                <otherCitationDetailsCA_RadiometryPreCorrection>other information required
                to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryPreCorrection>
                <collectiveTitleCA_RadiometryPreCorrection>common title with holdings
                note</collectiveTitleCA_RadiometryPreCorrection>
                <ISBNCA_RadiometryPreCorrection>international Standard Book
                Number</ISBNCA_RadiometryPreCorrection>
                <ISSNCA_RadiometryPreCorrection>international Standard Serial
                Number</ISSNCA_RadiometryPreCorrection>
            </CI_CitationCA_RadiometryPreCorrection>
        </filterType>
        <parametersCA_RadiometryPreCorrection>0.0</parametersCA_RadiometryPreCorrection>
    </CA_RadiometryPreCorrection>
    <CA_RadiometryTestRange>
        <calibrationType>laboratory</calibrationType>
        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>
        <lampType>type of illumination used</lampType>
        <atmosphericConditionCA_RadiometryInFlight>state of the
        atmosphere</atmosphericConditionCA_RadiometryInFlight>
        <aerosolQuantity>0.0</aerosolQuantity>
        <numberPoints>0</numberPoints>
        <controlPointCA_RadiometryTestRange>0.0</controlPointCA_RadiometryTestRange>
        <expanse uom="#m">0.0</expanse>
        <minimumElevationCA_RadiometryTestRange
        uom="#m">0.0</minimumElevationCA_RadiometryTestRange>
        <maximumElevationCA_RadiometryTestRange
        uom="#m">0.0</maximumElevationCA_RadiometryTestRange>
        <averageElevationCA_RadiometryTestRange
        uom="#m">0.0</averageElevationCA_RadiometryTestRange>
    </CA_RadiometryTestRange>
    <CA_RadiometryValidation>
        <calibrationType>laboratory</calibrationType>
        <rmseComparisonObject>0.0</rmseComparisonObject>
        <validationTimeCA_RadiometryValidation>0-0-0
        00:00:00</validationTimeCA_RadiometryValidation>
    </CA_RadiometryValidation>
    <CA_SensorCharacteristics>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
```

```
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
                        <alternateTitleCA_RadiometryInSensor>short name or other language
                        name by which the cited information is
                        known</alternateTitleCA_RadiometryInSensor>
                        <dateCA_RadiometryInSensor>
                            <CI_DateCA_RadiometryInSensor>

                                <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                                diometryInSensor>

                                <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                                InSensor>
                            </CI_DateCA_RadiometryInSensor>
                        </dateCA_RadiometryInSensor>
                        <editionCA_RadiometryInSensor>version of the cited
                        resource</editionCA_RadiometryInSensor>
                        <editionDateCA_RadiometryInSensor>

                            <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
                            A_RadiometryInSensor>
                        </editionDateCA_RadiometryInSensor>
                        <identifierCA_RadiometryInSensor>
                            <MD_IdentifierCA_RadiometryInSensor>
                                <authorityCA_RadiometryInSensor>person or party responsible
                                for maintenance of the
                                namespace</authorityCA_RadiometryInSensor>
                                <codeCA_RadiometryInSensor>alphanumeric value identifying an
                                instance in the namespace</codeCA_RadiometryInSensor>
                            </MD_IdentifierCA_RadiometryInSensor>
                        </identifierCA_RadiometryInSensor>
                        <citedResponsiblePartyCA_RadiometryInSensor>
                            <CI_ResponsiblePartyCA_RadiometryInSensor>
                                <individualNameCA_RadiometryInSensor>name of the responsible
                                person- surname,given name, title separated by a
                                delimiter</individualNameCA_RadiometryInSensor>
                                <organisationNameCA_RadiometryInSensor>name of the
                                responsible
                                organization</organisationNameCA_RadiometryInSensor>
                                <positionNameCA_RadiometryInSensor>role or position of the
                                responsible person</positionNameCA_RadiometryInSensor>
                                <contactInfoCA_RadiometryInSensor>
                                    <CI_ContactCA_RadiometryInSensor>
                                        <phoneCA_RadiometryInSensor>
                                            <CI_TelephoneCA_RadiometryInSensor>
                                                <voiceCA_RadiometryInSensor>telephone number
                                                by which individuals can speak to the
                                                responsible organization or
                                                individual</voiceCA_RadiometryInSensor>
                                                <facsimileCA_RadiometryInSensor>telephone
                                                number of a facsimile machine for the
                                                responsible organization or
                                                individual</facsimileCA_RadiometryInSensor>
                                            </CI_TelephoneCA_RadiometryInSensor>
                                        </phoneCA_RadiometryInSensor>
```

```
<addressCA_RadiometryInSensor>
    <CI_AddressCA_RadiometryInSensor>
        <deliveryPointCA_RadiometryInSensor>address
        line for the
        location</deliveryPointCA_RadiometryInSensor>
        <cityCA_RadiometryInSensor>city of the
        location</cityCA_RadiometryInSensor>

        <administrativeAreaCA_RadiometryInSensor>state
        , province of the
        location</administrativeAreaCA_RadiometryInSen
        sor>
        <postalCodeCA_RadiometryInSensor>ZIP or
        other postal
        code</postalCodeCA_RadiometryInSensor>
        <countryCA_RadiometryInSensor>country of the
        physical
        address</countryCA_RadiometryInSensor>

        <electronicMailAddressCA_RadiometryInSensor>te
        lephone number of a facsimile machine for
        the responsible organization or
        individual</electronicMailAddressCA_Radiometry
        InSensor>
    </CI_AddressCA_RadiometryInSensor>
</addressCA_RadiometryInSensor>
<onlineResourceCA_RadiometryInSensor>
    <CI_OnlineResourceCA_RadiometryInSensor>
        <linkageCA_RadiometryInSensor>location
        (address) for on-line access using a Uniform
        Resource Locator address or similar
        addressing
        scheme</linkageCA_RadiometryInSensor>
        <protocolCA_RadiometryInSensor>connection
        protocol to be
        used</protocolCA_RadiometryInSensor>

        <applicationProfileCA_RadiometryInSensor>name
        of an application profile that can be used
        with the online
        resource</applicationProfileCA_RadiometryInSen
        sor>

        <nameCI_OnlineResourceCA_RadiometryInSensor>na
        me of the online
        resource</nameCI_OnlineResourceCA_RadiometryIn
        Sensor>

        <descriptionCI_OnlineResourceCA_RadiometryInSe
        nsor>detailed text description of what the
        online resource
        is/does</descriptionCI_OnlineResourceCA_Radiom
        etryInSensor>

        <functionCA_RadiometryInSensor>download</funct
        ionCA_RadiometryInSensor>
    </CI_OnlineResourceCA_RadiometryInSensor>
</onlineResourceCA_RadiometryInSensor>
<hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact
the organization or
individual</hoursOfServiceCA_RadiometryInSensor>

<contactInstructionsCA_RadiometryInSensor>supplemental
 instructions on how or when to contact the
individual or
organization</contactInstructionsCA_RadiometryInSensor
```

```
                                >
                            </CI_ContactCA_RadiometryInSensor>
                        </contactInfoCA_RadiometryInSensor>

                        <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                        InSensor>
                    </CI_ResponsiblePartyCA_RadiometryInSensor>
                </citedResponsiblePartyCA_RadiometryInSensor>

                <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
                rmCA_RadiometryInSensor>
                <seriesCA_RadiometryInSensor>
                    <CI_SeriesCA_RadiometryInSensor>
                        <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryInSensor>
                        <issueIdentificationCA_RadiometryInSensor>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
```

```
                                    for the location</deliveryPointCA_RadiometryInSensor1>
                                    <cityCA_RadiometryInSensor1>city of the
                                    location</cityCA_RadiometryInSensor1>
                                    <administrativeAreaCA_RadiometryInSensor1>state,
                                    province of the
                                    location</administrativeAreaCA_RadiometryInSensor1>
                                    <postalCodeCA_RadiometryInSensor1>ZIP or other
                                    postal code</postalCodeCA_RadiometryInSensor1>
                                    <countryCA_RadiometryInSensor1>country of the
                                    physical address</countryCA_RadiometryInSensor1>

                                    <electronicMailAddressCA_RadiometryInSensor1>telephone
                                     number of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <sensorIdentification>
        <MD_IdentificationCA_SensorCharacteristics>
            <citationCA_SensorCharacteristics>
                <CI_CitationCA_SensorCharacteristics>
                    <titleCA_SensorCharacteristics>name by which the cited resource is
                    known</titleCA_SensorCharacteristics>
                    <alternateTitleCA_SensorCharacteristics>short name or other language
                    name by which the cited information is
                    known</alternateTitleCA_SensorCharacteristics>
```

```
<dateCA_SensorCharacteristics>
    <CI_DateCA_SensorCharacteristics>

        <dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA
        _SensorCharacteristics>

        <dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorC
        haracteristics>
    </CI_DateCA_SensorCharacteristics>
</dateCA_SensorCharacteristics>
<editionCA_SensorCharacteristics>version of the cited
resource</editionCA_SensorCharacteristics>
<editionDateCA_SensorCharacteristics>

    <dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDa
    teCA_SensorCharacteristics>
</editionDateCA_SensorCharacteristics>
<identifierCA_SensorCharacteristics>
    <MD_IdentifierCA_SensorCharacteristics>
        <authorityCA_SensorCharacteristics>person or party
        responsible for maintenance of the
        namespace</authorityCA_SensorCharacteristics>
        <codeCA_SensorCharacteristics>alphanumeric value identifying
        an instance in the namespace</codeCA_SensorCharacteristics>
    </MD_IdentifierCA_SensorCharacteristics>
</identifierCA_SensorCharacteristics>
<citedResponsiblePartyCA_SensorCharacteristics>
    <CI_ResponsiblePartyCA_SensorCharacteristics>
        <individualNameCA_SensorCharacteristics>name of the
        responsible person- surname,given name, title separated by a
        delimiter</individualNameCA_SensorCharacteristics>
        <organisationNameCA_SensorCharacteristics>name of the
        responsible
        organization</organisationNameCA_SensorCharacteristics>
        <positionNameCA_SensorCharacteristics>role or position of
        the responsible person</positionNameCA_SensorCharacteristics>
        <contactInfoCA_SensorCharacteristics>
            <CI_ContactCA_SensorCharacteristics>
                <phoneCA_SensorCharacteristics>
                    <CI_TelephoneCA_SensorCharacteristics>
                        <voiceCA_SensorCharacteristics>telephone
                        number by which individuals can speak to the
                        responsible organization or
                        individual</voiceCA_SensorCharacteristics>
                        <facsimileCA_SensorCharacteristics>telephone
                        number of a facsimile machine for the
                        responsible organization or
                        individual</facsimileCA_SensorCharacteristics>
                    </CI_TelephoneCA_SensorCharacteristics>
                </phoneCA_SensorCharacteristics>
                <addressCA_SensorCharacteristics>
                    <CI_AddressCA_SensorCharacteristics>

                        <deliveryPointCA_SensorCharacteristics>address
                         line for the
                        location</deliveryPointCA_SensorCharacteristic
                        s>
                        <cityCA_SensorCharacteristics>city of the
                        location</cityCA_SensorCharacteristics>

                        <administrativeAreaCA_SensorCharacteristics>st
                        ate, province of the
                        location</administrativeAreaCA_SensorCharacter
                        istics>
                        <postalCodeCA_SensorCharacteristics>ZIP or
                        other postal
                        code</postalCodeCA_SensorCharacteristics>
```

```
                                    <countryCA_SensorCharacteristics>country of
                                    the physical
                                    address</countryCA_SensorCharacteristics>

                                    <electronicMailAddressCA_SensorCharacteristics
                                    >telephone number of a facsimile machine for
                                    the responsible organization or
                                    individual</electronicMailAddressCA_SensorChar
                                    acteristics>
                                </CI_AddressCA_SensorCharacteristics>
                            </addressCA_SensorCharacteristics>
                            <onlineResourceCA_SensorCharacteristics>
                                <CI_OnlineResourceCA_SensorCharacteristics>
                                    <linkageCA_SensorCharacteristics>location
                                    (address) for on-line access using a Uniform
                                    Resource Locator address or similar
                                    addressing
                                    scheme</linkageCA_SensorCharacteristics>
                                    <protocolCA_SensorCharacteristics>connection
                                    protocol to be
                                    used</protocolCA_SensorCharacteristics>

                                    <applicationProfileCA_SensorCharacteristics>na
                                    me of an application profile that can be
                                    used with the online
                                    resource</applicationProfileCA_SensorCharacter
                                    istics>

                                    <nameCI_OnlineResourceCA_SensorCharacteristics
                                    >name of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharac
                                    teristics>

                                    <descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics>detailed text description of what
                                    the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Sensor
                                    Characteristics>

                                    <functionCA_SensorCharacteristics>download</fu
                                    nctionCA_SensorCharacteristics>
                                </CI_OnlineResourceCA_SensorCharacteristics>
                            </onlineResourceCA_SensorCharacteristics>
                            <hoursOfServiceCA_SensorCharacteristics>time period
                            (including time zone) when individuals can contact
                            the organization or
                            individual</hoursOfServiceCA_SensorCharacteristics>

                            <contactInstructionsCA_SensorCharacteristics>supplemen
                            tal instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_SensorCharacterist
                            ics>
                        </CI_ContactCA_SensorCharacteristics>
                    </contactInfoCA_SensorCharacteristics>

                    <roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorC
                    haracteristics>
                </CI_ResponsiblePartyCA_SensorCharacteristics>
            </citedResponsiblePartyCA_SensorCharacteristics>

            <presentationFormCA_SensorCharacteristics>documentDigital</presentatio
            nFormCA_SensorCharacteristics>
            <seriesCA_SensorCharacteristics>
                <CI_SeriesCA_SensorCharacteristics>
                    <nameCI_SeriesCA_SensorCharacteristics>name of the series,
                    or aggregate dataset, of which the dataset is a
```

```
                    part</nameCI_SeriesCA_SensorCharacteristics>
                    <issueIdentificationCA_SensorCharacteristics>information
                    identifying the issue of the
                    series</issueIdentificationCA_SensorCharacteristics>
                    <pageCA_SensorCharacteristics>details on which pages of the
                    publication the article was
                    published</pageCA_SensorCharacteristics>
                </CI_SeriesCA_SensorCharacteristics>
            </seriesCA_SensorCharacteristics>
            <otherCitationDetailsCA_SensorCharacteristics>other information
            required to complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_SensorCharacteristics>
            <collectiveTitleCA_SensorCharacteristics>common title with holdings
            note</collectiveTitleCA_SensorCharacteristics>
            <ISBNCA_SensorCharacteristics>international Standard Book
            Number</ISBNCA_SensorCharacteristics>
            <ISSNCA_SensorCharacteristics>international Standard Serial
            Number</ISSNCA_SensorCharacteristics>
        </CI_CitationCA_SensorCharacteristics>
    </citationCA_SensorCharacteristics>
    <abstractCA_SensorCharacteristics>brief narrative summary of the content of
    the resource(s)</abstractCA_SensorCharacteristics>
    <purposeCA_SensorCharacteristics>summary of the intentions with which the
    resource(s) was developed</purposeCA_SensorCharacteristics>
    <creditCA_SensorCharacteristics>recognition of those who contributed to the
    resource(s)</creditCA_SensorCharacteristics>
    <statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>
    <pointOfContactCA_SensorCharacteristics>
        <CI_ResponsiblePartyCA_SensorCharacteristics1>
            <individualNameCA_SensorCharacteristics1>name of the responsible
            person- surname,given name, title separated by a
            delimiter</individualNameCA_SensorCharacteristics1>
            <organisationNameCA_SensorCharacteristics1>name of the responsible
            organization</organisationNameCA_SensorCharacteristics1>
            <positionNameCA_SensorCharacteristics1>role or position of the
            responsible person</positionNameCA_SensorCharacteristics1>
            <contactInfoCA_SensorCharacteristics1>
                <CI_ContactCA_SensorCharacteristics1>
                    <phoneCA_SensorCharacteristics1>
                        <CI_TelephoneCA_SensorCharacteristics1>
                            <voiceCA_SensorCharacteristics1>telephone number by
                            which individuals can speak to the responsible
                            organization or
                            individual</voiceCA_SensorCharacteristics1>
                            <facsimileCA_SensorCharacteristics1>telephone number
                            of a facsimile machine for the responsible
                            organization or
                            individual</facsimileCA_SensorCharacteristics1>
                        </CI_TelephoneCA_SensorCharacteristics1>
                    </phoneCA_SensorCharacteristics1>
                    <addressCA_SensorCharacteristics1>
                        <CI_AddressCA_SensorCharacteristics1>
                            <deliveryPointCA_SensorCharacteristics1>address line
                            for the
                            location</deliveryPointCA_SensorCharacteristics1>
                            <cityCA_SensorCharacteristics1>city of the
                            location</cityCA_SensorCharacteristics1>
                            <administrativeAreaCA_SensorCharacteristics1>state,
                            province of the
                            location</administrativeAreaCA_SensorCharacteristics1>
                            <postalCodeCA_SensorCharacteristics1>ZIP or other
                            postal code</postalCodeCA_SensorCharacteristics1>
                            <countryCA_SensorCharacteristics1>country of the
                            physical address</countryCA_SensorCharacteristics1>

                            <electronicMailAddressCA_SensorCharacteristics1>teleph
                            one number of a facsimile machine for the
```

```
                                    responsible organization or
                                    individual</electronicMailAddressCA_SensorCharacterist
                                    ics1>
                                </CI_AddressCA_SensorCharacteristics1>
                            </addressCA_SensorCharacteristics1>
                            <onlineResourceCA_SensorCharacteristics1>
                                <CI_OnlineResourceCA_SensorCharacteristics1>
                                    <linkageCA_SensorCharacteristics1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_SensorCharacteristics1>
                                    <protocolCA_SensorCharacteristics1>connection
                                    protocol to be
                                    used</protocolCA_SensorCharacteristics1>
                                    <applicationProfileCA_SensorCharacteristics1>name of
                                    an application profile that can be used with the
                                    online
                                    resource</applicationProfileCA_SensorCharacteristics1>
                                    <nameCI_OnlineResourceCA_SensorCharacteristics1>name
                                    of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharacteristic
                                    s1>

                                    <descriptionCI_OnlineResourceCA_SensorCharacteristics1
                                    >detailed text description of what the online
                                    resource
                                    is/does</descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics1>

                                    <functionCA_SensorCharacteristics1>download</functionC
                                    A_SensorCharacteristics1>
                                </CI_OnlineResourceCA_SensorCharacteristics1>
                            </onlineResourceCA_SensorCharacteristics1>
                            <hoursOfServiceCA_SensorCharacteristics1>time period
                            (including time zone) when individuals can contact the
                            organization or
                            individual</hoursOfServiceCA_SensorCharacteristics1>
                            <contactInstructionsCA_SensorCharacteristics1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_SensorCharacteristics1>
                        </CI_ContactCA_SensorCharacteristics1>
                    </contactInfoCA_SensorCharacteristics1>

                    <roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacte
                    ristics1>
                </CI_ResponsiblePartyCA_SensorCharacteristics1>
            </pointOfContactCA_SensorCharacteristics>
        </MD_IdentificationCA_SensorCharacteristics>
    </sensorIdentification>
    <cameraHead>camera or sensor head for which the information is valid</cameraHead>
    <channel>channel for which the information is valid</channel>
</CA_SensorCharacteristics>
<CA_SensorDefects>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
    <maxWavelength>0.0</maxWavelength>
    <b>0.0</b>
    <c>0.0</c>
    <sensorSystemIdentification>
        <MD_IdentificationCA_RadiometryInSensor>
            <citationCA_RadiometryInSensor>
                <CI_CitationCA_RadiometryInSensor>
```

```
<titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>
<alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is
known</alternateTitleCA_RadiometryInSensor>
<dateCA_RadiometryInSensor>
    <CI_DateCA_RadiometryInSensor>

        <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
        diometryInSensor>

        <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
        InSensor>
    </CI_DateCA_RadiometryInSensor>
</dateCA_RadiometryInSensor>
<editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>
<editionDateCA_RadiometryInSensor>

    <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
    A_RadiometryInSensor>
</editionDateCA_RadiometryInSensor>
<identifierCA_RadiometryInSensor>
    <MD_IdentifierCA_RadiometryInSensor>
        <authorityCA_RadiometryInSensor>person or party responsible
        for maintenance of the
        namespace</authorityCA_RadiometryInSensor>
        <codeCA_RadiometryInSensor>alphanumeric value identifying an
        instance in the namespace</codeCA_RadiometryInSensor>
    </MD_IdentifierCA_RadiometryInSensor>
</identifierCA_RadiometryInSensor>
<citedResponsiblePartyCA_RadiometryInSensor>
    <CI_ResponsiblePartyCA_RadiometryInSensor>
        <individualNameCA_RadiometryInSensor>name of the responsible
        person- surname,given name, title separated by a
        delimiter</individualNameCA_RadiometryInSensor>
        <organisationNameCA_RadiometryInSensor>name of the
        responsible
        organization</organisationNameCA_RadiometryInSensor>
        <positionNameCA_RadiometryInSensor>role or position of the
        responsible person</positionNameCA_RadiometryInSensor>
        <contactInfoCA_RadiometryInSensor>
            <CI_ContactCA_RadiometryInSensor>
                <phoneCA_RadiometryInSensor>
                    <CI_TelephoneCA_RadiometryInSensor>
                        <voiceCA_RadiometryInSensor>telephone number
                        by which individuals can speak to the
                        responsible organization or
                        individual</voiceCA_RadiometryInSensor>
                        <facsimileCA_RadiometryInSensor>telephone
                        number of a facsimile machine for the
                        responsible organization or
                        individual</facsimileCA_RadiometryInSensor>
                    </CI_TelephoneCA_RadiometryInSensor>
                </phoneCA_RadiometryInSensor>
                <addressCA_RadiometryInSensor>
                    <CI_AddressCA_RadiometryInSensor>
                        <deliveryPointCA_RadiometryInSensor>address
                        line for the
                        location</deliveryPointCA_RadiometryInSensor>
                        <cityCA_RadiometryInSensor>city of the
                        location</cityCA_RadiometryInSensor>

                        <administrativeAreaCA_RadiometryInSensor>state
                        , province of the
                        location</administrativeAreaCA_RadiometryInSen
                        sor>
```

```
                                    <postalCodeCA_RadiometryInSensor>ZIP or
                                    other postal
                                    code</postalCodeCA_RadiometryInSensor>
                                    <countryCA_RadiometryInSensor>country of the
                                    physical
                                    address</countryCA_RadiometryInSensor>

                                    <electronicMailAddressCA_RadiometryInSensor>te
                                    lephone number of a facsimile machine for
                                    the responsible organization or
                                    individual</electronicMailAddressCA_Radiometry
                                    InSensor>
                                </CI_AddressCA_RadiometryInSensor>
                            </addressCA_RadiometryInSensor>
                            <onlineResourceCA_RadiometryInSensor>
                                <CI_OnlineResourceCA_RadiometryInSensor>
                                    <linkageCA_RadiometryInSensor>location
                                    (address) for on-line access using a Uniform
                                    Resource Locator address or similar
                                    addressing
                                    scheme</linkageCA_RadiometryInSensor>
                                    <protocolCA_RadiometryInSensor>connection
                                    protocol to be
                                    used</protocolCA_RadiometryInSensor>

                                    <applicationProfileCA_RadiometryInSensor>name
                                    of an application profile that can be used
                                    with the online
                                    resource</applicationProfileCA_RadiometryInSen
                                    sor>

                                    <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                    me of the online
                                    resource</nameCI_OnlineResourceCA_RadiometryIn
                                    Sensor>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor>detailed text description of what the
                                    online resource
                                    is/does</descriptionCI_OnlineResourceCA_Radiom
                                    etryInSensor>

                                    <functionCA_RadiometryInSensor>download</funct
                                    ionCA_RadiometryInSensor>
                                </CI_OnlineResourceCA_RadiometryInSensor>
                            </onlineResourceCA_RadiometryInSensor>
                            <hoursOfServiceCA_RadiometryInSensor>time period
                            (including time zone) when individuals can contact
                            the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor>

                            <contactInstructionsCA_RadiometryInSensor>supplemental
                             instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_RadiometryInSensor
                            >
                        </CI_ContactCA_RadiometryInSensor>
                    </contactInfoCA_RadiometryInSensor>

                    <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                    InSensor>
                </CI_ResponsiblePartyCA_RadiometryInSensor>
            </citedResponsiblePartyCA_RadiometryInSensor>

            <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
            rmCA_RadiometryInSensor>
            <seriesCA_RadiometryInSensor>
```

```
                    <CI_SeriesCA_RadiometryInSensor>
                        <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryInSensor>
                        <issueIdentificationCA_RadiometryInSensor>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
```

```
                                    number of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <sensorIdentification>
        <MD_IdentificationCA_SensorCharacteristics>
            <citationCA_SensorCharacteristics>
                <CI_CitationCA_SensorCharacteristics>
                    <titleCA_SensorCharacteristics>name by which the cited resource is
                    known</titleCA_SensorCharacteristics>
                    <alternateTitleCA_SensorCharacteristics>short name or other language
                    name by which the cited information is
                    known</alternateTitleCA_SensorCharacteristics>
                    <dateCA_SensorCharacteristics>
                        <CI_DateCA_SensorCharacteristics>

                            <dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA
                            _SensorCharacteristics>

                            <dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorC
                            haracteristics>
                        </CI_DateCA_SensorCharacteristics>
                    </dateCA_SensorCharacteristics>
                    <editionCA_SensorCharacteristics>version of the cited
                    resource</editionCA_SensorCharacteristics>
```

```
                    <editionDateCA_SensorCharacteristics>

                        <dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDa
                        teCA_SensorCharacteristics>
                    </editionDateCA_SensorCharacteristics>
                    <identifierCA_SensorCharacteristics>
                        <MD_IdentifierCA_SensorCharacteristics>
                            <authorityCA_SensorCharacteristics>person or party
                            responsible for maintenance of the
                            namespace</authorityCA_SensorCharacteristics>
                            <codeCA_SensorCharacteristics>alphanumeric value identifying
                            an instance in the namespace</codeCA_SensorCharacteristics>
                        </MD_IdentifierCA_SensorCharacteristics>
                    </identifierCA_SensorCharacteristics>
                    <citedResponsiblePartyCA_SensorCharacteristics>
                        <CI_ResponsiblePartyCA_SensorCharacteristics>
                            <individualNameCA_SensorCharacteristics>name of the
                            responsible person- surname,given name, title separated by a
                            delimiter</individualNameCA_SensorCharacteristics>
                            <organisationNameCA_SensorCharacteristics>name of the
                            responsible
                            organization</organisationNameCA_SensorCharacteristics>
                            <positionNameCA_SensorCharacteristics>role or position of
                            the responsible person</positionNameCA_SensorCharacteristics>
                            <contactInfoCA_SensorCharacteristics>
                                <CI_ContactCA_SensorCharacteristics>
                                    <phoneCA_SensorCharacteristics>
                                        <CI_TelephoneCA_SensorCharacteristics>
                                            <voiceCA_SensorCharacteristics>telephone
                                            number by which individuals can speak to the
                                            responsible organization or
                                            individual</voiceCA_SensorCharacteristics>
                                            <facsimileCA_SensorCharacteristics>telephone
                                            number of a facsimile machine for the
                                            responsible organization or
                                            individual</facsimileCA_SensorCharacteristics>
                                        </CI_TelephoneCA_SensorCharacteristics>
                                    </phoneCA_SensorCharacteristics>
                                    <addressCA_SensorCharacteristics>
                                        <CI_AddressCA_SensorCharacteristics>

                                            <deliveryPointCA_SensorCharacteristics>address
                                             line for the
                                            location</deliveryPointCA_SensorCharacteristic
                                            s>
                                            <cityCA_SensorCharacteristics>city of the
                                            location</cityCA_SensorCharacteristics>

                                            <administrativeAreaCA_SensorCharacteristics>st
                                            ate, province of the
                                            location</administrativeAreaCA_SensorCharacter
                                            istics>
                                            <postalCodeCA_SensorCharacteristics>ZIP or
                                            other postal
                                            code</postalCodeCA_SensorCharacteristics>
                                            <countryCA_SensorCharacteristics>country of
                                            the physical
                                            address</countryCA_SensorCharacteristics>

                                            <electronicMailAddressCA_SensorCharacteristics
                                            >telephone number of a facsimile machine for
                                            the responsible organization or
                                            individual</electronicMailAddressCA_SensorChar
                                            acteristics>
                                        </CI_AddressCA_SensorCharacteristics>
                                    </addressCA_SensorCharacteristics>
                                    <onlineResourceCA_SensorCharacteristics>
```

```
                                <CI_OnlineResourceCA_SensorCharacteristics>
                                    <linkageCA_SensorCharacteristics>location
                                    (address) for on-line access using a Uniform
                                    Resource Locator address or similar
                                    addressing
                                    scheme</linkageCA_SensorCharacteristics>
                                    <protocolCA_SensorCharacteristics>connection
                                    protocol to be
                                    used</protocolCA_SensorCharacteristics>

                                    <applicationProfileCA_SensorCharacteristics>na
                                    me of an application profile that can be
                                    used with the online
                                    resource</applicationProfileCA_SensorCharacter
                                    istics>

                                    <nameCI_OnlineResourceCA_SensorCharacteristics
                                    >name of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharac
                                    teristics>

                                    <descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics>detailed text description of what
                                    the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Sensor
                                    Characteristics>

                                    <functionCA_SensorCharacteristics>download</fu
                                    nctionCA_SensorCharacteristics>
                                </CI_OnlineResourceCA_SensorCharacteristics>
                            </onlineResourceCA_SensorCharacteristics>
                            <hoursOfServiceCA_SensorCharacteristics>time period
                            (including time zone) when individuals can contact
                            the organization or
                            individual</hoursOfServiceCA_SensorCharacteristics>

                            <contactInstructionsCA_SensorCharacteristics>supplemen
                            tal instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_SensorCharacterist
                            ics>
                        </CI_ContactCA_SensorCharacteristics>
                    </contactInfoCA_SensorCharacteristics>

                    <roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorC
                    haracteristics>
                </CI_ResponsiblePartyCA_SensorCharacteristics>
            </citedResponsiblePartyCA_SensorCharacteristics>

            <presentationFormCA_SensorCharacteristics>documentDigital</presentatio
            nFormCA_SensorCharacteristics>
            <seriesCA_SensorCharacteristics>
                <CI_SeriesCA_SensorCharacteristics>
                    <nameCI_SeriesCA_SensorCharacteristics>name of the series,
                    or aggregate dataset, of which the dataset is a
                    part</nameCI_SeriesCA_SensorCharacteristics>
                    <issueIdentificationCA_SensorCharacteristics>information
                    identifying the issue of the
                    series</issueIdentificationCA_SensorCharacteristics>
                    <pageCA_SensorCharacteristics>details on which pages of the
                    publication the article was
                    published</pageCA_SensorCharacteristics>
                </CI_SeriesCA_SensorCharacteristics>
            </seriesCA_SensorCharacteristics>
            <otherCitationDetailsCA_SensorCharacteristics>other information
            required to complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_SensorCharacteristics>
```

```
                    <collectiveTitleCA_SensorCharacteristics>common title with holdings
                    note</collectiveTitleCA_SensorCharacteristics>
                    <ISBNCA_SensorCharacteristics>international Standard Book
                    Number</ISBNCA_SensorCharacteristics>
                    <ISSNCA_SensorCharacteristics>international Standard Serial
                    Number</ISSNCA_SensorCharacteristics>
                </CI_CitationCA_SensorCharacteristics>
            </citationCA_SensorCharacteristics>
            <abstractCA_SensorCharacteristics>brief narrative summary of the content of
            the resource(s)</abstractCA_SensorCharacteristics>
            <purposeCA_SensorCharacteristics>summary of the intentions with which the
            resource(s) was developed</purposeCA_SensorCharacteristics>
            <creditCA_SensorCharacteristics>recognition of those who contributed to the
            resource(s)</creditCA_SensorCharacteristics>
            <statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>
            <pointOfContactCA_SensorCharacteristics>
                <CI_ResponsiblePartyCA_SensorCharacteristics1>
                    <individualNameCA_SensorCharacteristics1>name of the responsible
                    person- surname,given name, title separated by a
                    delimiter</individualNameCA_SensorCharacteristics1>
                    <organisationNameCA_SensorCharacteristics1>name of the responsible
                    organization</organisationNameCA_SensorCharacteristics1>
                    <positionNameCA_SensorCharacteristics1>role or position of the
                    responsible person</positionNameCA_SensorCharacteristics1>
                    <contactInfoCA_SensorCharacteristics1>
                        <CI_ContactCA_SensorCharacteristics1>
                            <phoneCA_SensorCharacteristics1>
                                <CI_TelephoneCA_SensorCharacteristics1>
                                    <voiceCA_SensorCharacteristics1>telephone number by
                                    which individuals can speak to the responsible
                                    organization or
                                    individual</voiceCA_SensorCharacteristics1>
                                    <facsimileCA_SensorCharacteristics1>telephone number
                                    of a facsimile machine for the responsible
                                    organization or
                                    individual</facsimileCA_SensorCharacteristics1>
                                </CI_TelephoneCA_SensorCharacteristics1>
                            </phoneCA_SensorCharacteristics1>
                            <addressCA_SensorCharacteristics1>
                                <CI_AddressCA_SensorCharacteristics1>
                                    <deliveryPointCA_SensorCharacteristics1>address line
                                    for the
                                    location</deliveryPointCA_SensorCharacteristics1>
                                    <cityCA_SensorCharacteristics1>city of the
                                    location</cityCA_SensorCharacteristics1>
                                    <administrativeAreaCA_SensorCharacteristics1>state,
                                    province of the
                                    location</administrativeAreaCA_SensorCharacteristics1>
                                    <postalCodeCA_SensorCharacteristics1>ZIP or other
                                    postal code</postalCodeCA_SensorCharacteristics1>
                                    <countryCA_SensorCharacteristics1>country of the
                                    physical address</countryCA_SensorCharacteristics1>

                                    <electronicMailAddressCA_SensorCharacteristics1>teleph
                                    one number of a facsimile machine for the
                                    responsible organization or
                                    individual</electronicMailAddressCA_SensorCharacterist
                                    ics1>
                                </CI_AddressCA_SensorCharacteristics1>
                            </addressCA_SensorCharacteristics1>
                            <onlineResourceCA_SensorCharacteristics1>
                                <CI_OnlineResourceCA_SensorCharacteristics1>
                                    <linkageCA_SensorCharacteristics1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_SensorCharacteristics1>
                                    <protocolCA_SensorCharacteristics1>connection
```

```
                                    protocol to be
                                    used</protocolCA_SensorCharacteristics1>
                                    <applicationProfileCA_SensorCharacteristics1>name of
                                    an application profile that can be used with the
                                    online
                                    resource</applicationProfileCA_SensorCharacteristics1>
                                    <nameCI_OnlineResourceCA_SensorCharacteristics1>name
                                    of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharacteristic
                                    s1>

                                    <descriptionCI_OnlineResourceCA_SensorCharacteristics1
                                    >detailed text description of what the online
                                    resource
                                    is/does</descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics1>

                                    <functionCA_SensorCharacteristics1>download</functionC
                                    A_SensorCharacteristics1>
                                </CI_OnlineResourceCA_SensorCharacteristics1>
                            </onlineResourceCA_SensorCharacteristics1>
                            <hoursOfServiceCA_SensorCharacteristics1>time period
                            (including time zone) when individuals can contact the
                            organization or
                            individual</hoursOfServiceCA_SensorCharacteristics1>
                            <contactInstructionsCA_SensorCharacteristics1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_SensorCharacteristics1>
                        </CI_ContactCA_SensorCharacteristics1>
                    </contactInfoCA_SensorCharacteristics1>

                    <roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacte
                    ristics1>
                </CI_ResponsiblePartyCA_SensorCharacteristics1>
            </pointOfContactCA_SensorCharacteristics>
        </MD_IdentificationCA_SensorCharacteristics>
    </sensorIdentification>
    <cameraHead>camera or sensor head for which the information is valid</cameraHead>
    <channel>channel for which the information is valid</channel>
    <colourAberration>definition of a geometric bias of the co-registration of the
    colour channels</colourAberration>
    <strayLight>definition of the amount of stray light of the sensor</strayLight>
    <residualPolarization>definition of the non-compensated parts of the
    polarization</residualPolarization>
    <smile>description of the smile distortion of the optical system</smile>
    <keystoneEffect>yes</keystoneEffect>
</CA_SensorDefects>
<CA_SensorMeasurement>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
    <maxWavelength>0.0</maxWavelength>
    <b>0.0</b>
    <c>0.0</c>
    <sensorSystemIdentification>
        <MD_IdentificationCA_RadiometryInSensor>
            <citationCA_RadiometryInSensor>
                <CI_CitationCA_RadiometryInSensor>
                    <titleCA_RadiometryInSensor>name by which the cited resource is
                    known</titleCA_RadiometryInSensor>
                    <alternateTitleCA_RadiometryInSensor>short name or other language
                    name by which the cited information is
                    known</alternateTitleCA_RadiometryInSensor>
```

```
                    <dateCA_RadiometryInSensor>
                        <CI_DateCA_RadiometryInSensor>

                            <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                            diometryInSensor>

                            <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                            InSensor>
                        </CI_DateCA_RadiometryInSensor>
                    </dateCA_RadiometryInSensor>
                    <editionCA_RadiometryInSensor>version of the cited
                    resource</editionCA_RadiometryInSensor>
                    <editionDateCA_RadiometryInSensor>

                        <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
                        A_RadiometryInSensor>
                    </editionDateCA_RadiometryInSensor>
                    <identifierCA_RadiometryInSensor>
                        <MD_IdentifierCA_RadiometryInSensor>
                            <authorityCA_RadiometryInSensor>person or party responsible
                            for maintenance of the
                            namespace</authorityCA_RadiometryInSensor>
                            <codeCA_RadiometryInSensor>alphanumeric value identifying an
                            instance in the namespace</codeCA_RadiometryInSensor>
                        </MD_IdentifierCA_RadiometryInSensor>
                    </identifierCA_RadiometryInSensor>
                    <citedResponsiblePartyCA_RadiometryInSensor>
                        <CI_ResponsiblePartyCA_RadiometryInSensor>
                            <individualNameCA_RadiometryInSensor>name of the responsible
                            person- surname,given name, title separated by a
                            delimiter</individualNameCA_RadiometryInSensor>
                            <organisationNameCA_RadiometryInSensor>name of the
                            responsible
                            organization</organisationNameCA_RadiometryInSensor>
                            <positionNameCA_RadiometryInSensor>role or position of the
                            responsible person</positionNameCA_RadiometryInSensor>
                            <contactInfoCA_RadiometryInSensor>
                                <CI_ContactCA_RadiometryInSensor>
                                    <phoneCA_RadiometryInSensor>
                                        <CI_TelephoneCA_RadiometryInSensor>
                                            <voiceCA_RadiometryInSensor>telephone number
                                            by which individuals can speak to the
                                            responsible organization or
                                            individual</voiceCA_RadiometryInSensor>
                                            <facsimileCA_RadiometryInSensor>telephone
                                            number of a facsimile machine for the
                                            responsible organization or
                                            individual</facsimileCA_RadiometryInSensor>
                                        </CI_TelephoneCA_RadiometryInSensor>
                                    </phoneCA_RadiometryInSensor>
                                    <addressCA_RadiometryInSensor>
                                        <CI_AddressCA_RadiometryInSensor>
                                            <deliveryPointCA_RadiometryInSensor>address
                                            line for the
                                            location</deliveryPointCA_RadiometryInSensor>
                                            <cityCA_RadiometryInSensor>city of the
                                            location</cityCA_RadiometryInSensor>

                                            <administrativeAreaCA_RadiometryInSensor>state
                                            , province of the
                                            location</administrativeAreaCA_RadiometryInSen
                                            sor>
                                            <postalCodeCA_RadiometryInSensor>ZIP or
                                            other postal
                                            code</postalCodeCA_RadiometryInSensor>
                                            <countryCA_RadiometryInSensor>country of the
                                            physical
```

```
                                    address</countryCA_RadiometryInSensor>

                                    <electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>
                                </CI_AddressCA_RadiometryInSensor>
                            </addressCA_RadiometryInSensor>
                            <onlineResourceCA_RadiometryInSensor>
                                <CI_OnlineResourceCA_RadiometryInSensor>
                                    <linkageCA_RadiometryInSensor>location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme</linkageCA_RadiometryInSensor>
                                    <protocolCA_RadiometryInSensor>connection protocol to be used</protocolCA_RadiometryInSensor>

                                    <applicationProfileCA_RadiometryInSensor>name of an application profile that can be used with the online resource</applicationProfileCA_RadiometryInSensor>

                                    <nameCI_OnlineResourceCA_RadiometryInSensor>name of the online resource</nameCI_OnlineResourceCA_RadiometryInSensor>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>

                                    <functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>
                                </CI_OnlineResourceCA_RadiometryInSensor>
                            </onlineResourceCA_RadiometryInSensor>
                            <hoursOfServiceCA_RadiometryInSensor>time period (including time zone) when individuals can contact the organization or individual</hoursOfServiceCA_RadiometryInSensor>

                            <contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to contact the individual or organization</contactInstructionsCA_RadiometryInSensor>
                        </CI_ContactCA_RadiometryInSensor>
                    </contactInfoCA_RadiometryInSensor>

                    <roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>
                </CI_ResponsiblePartyCA_RadiometryInSensor>
            </citedResponsiblePartyCA_RadiometryInSensor>

            <presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
            <seriesCA_RadiometryInSensor>
                <CI_SeriesCA_RadiometryInSensor>
                    <nameCI_SeriesCA_RadiometryInSensor>name of the series, or aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>
                    <issueIdentificationCA_RadiometryInSensor>information
```

```
                    identifying the issue of the
                    series</issueIdentificationCA_RadiometryInSensor>
                    <pageCA_RadiometryInSensor>details on which pages of the
                    publication the article was
                    published</pageCA_RadiometryInSensor>
                </CI_SeriesCA_RadiometryInSensor>
            </seriesCA_RadiometryInSensor>
            <otherCitationDetailsCA_RadiometryInSensor>other information
            required to complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_RadiometryInSensor>
            <collectiveTitleCA_RadiometryInSensor>common title with holdings
            note</collectiveTitleCA_RadiometryInSensor>
            <ISBNCA_RadiometryInSensor>international Standard Book
            Number</ISBNCA_RadiometryInSensor>
            <ISSNCA_RadiometryInSensor>international Standard Serial
            Number</ISSNCA_RadiometryInSensor>
        </CI_CitationCA_RadiometryInSensor>
    </citationCA_RadiometryInSensor>
    <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
    resource(s)</abstractCA_RadiometryInSensor>
    <purposeCA_RadiometryInSensor>summary of the intentions with which the
    resource(s) was developed</purposeCA_RadiometryInSensor>
    <creditCA_RadiometryInSensor>recognition of those who contributed to the
    resource(s)</creditCA_RadiometryInSensor>
    <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
    <pointOfContactCA_RadiometryInSensor>
        <CI_ResponsiblePartyCA_RadiometryInSensor1>
            <individualNameCA_RadiometryInSensor1>name of the responsible
            person- surname,given name, title separated by a
            delimiter</individualNameCA_RadiometryInSensor1>
            <organisationNameCA_RadiometryInSensor1>name of the responsible
            organization</organisationNameCA_RadiometryInSensor1>
            <positionNameCA_RadiometryInSensor1>role or position of the
            responsible person</positionNameCA_RadiometryInSensor1>
            <contactInfoCA_RadiometryInSensor1>
                <CI_ContactCA_RadiometryInSensor1>
                    <phoneCA_RadiometryInSensor1>
                        <CI_TelephoneCA_RadiometryInSensor1>
                            <voiceCA_RadiometryInSensor1>telephone number by
                            which individuals can speak to the responsible
                            organization or
                            individual</voiceCA_RadiometryInSensor1>
                            <facsimileCA_RadiometryInSensor1>telephone number of
                            a facsimile machine for the responsible organization
                            or individual</facsimileCA_RadiometryInSensor1>
                        </CI_TelephoneCA_RadiometryInSensor1>
                    </phoneCA_RadiometryInSensor1>
                    <addressCA_RadiometryInSensor1>
                        <CI_AddressCA_RadiometryInSensor1>
                            <deliveryPointCA_RadiometryInSensor1>address line
                            for the location</deliveryPointCA_RadiometryInSensor1>
                            <cityCA_RadiometryInSensor1>city of the
                            location</cityCA_RadiometryInSensor1>
                            <administrativeAreaCA_RadiometryInSensor1>state,
                            province of the
                            location</administrativeAreaCA_RadiometryInSensor1>
                            <postalCodeCA_RadiometryInSensor1>ZIP or other
                            postal code</postalCodeCA_RadiometryInSensor1>
                            <countryCA_RadiometryInSensor1>country of the
                            physical address</countryCA_RadiometryInSensor1>

                            <electronicMailAddressCA_RadiometryInSensor1>telephone
                             number of a facsimile machine for the responsible
                            organization or
                            individual</electronicMailAddressCA_RadiometryInSensor
                            1>
                        </CI_AddressCA_RadiometryInSensor1>
```

```
                                </addressCA_RadiometryInSensor1>
                                <onlineResourceCA_RadiometryInSensor1>
                                    <CI_OnlineResourceCA_RadiometryInSensor1>
                                        <linkageCA_RadiometryInSensor1>location (address)
                                        for on-line access using a Uniform Resource Locator
                                        address or similar addressing
                                        scheme</linkageCA_RadiometryInSensor1>
                                        <protocolCA_RadiometryInSensor1>connection protocol
                                        to be used</protocolCA_RadiometryInSensor1>
                                        <applicationProfileCA_RadiometryInSensor1>name of an
                                        application profile that can be used with the online
                                        resource</applicationProfileCA_RadiometryInSensor1>
                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                        the online
                                        resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                        <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                        tailed text description of what the online resource
                                        is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                        nsor1>

                                        <functionCA_RadiometryInSensor1>download</functionCA_R
                                        adiometryInSensor1>
                                    </CI_OnlineResourceCA_RadiometryInSensor1>
                                </onlineResourceCA_RadiometryInSensor1>
                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
                                time zone) when individuals can contact the organization or
                                individual</hoursOfServiceCA_RadiometryInSensor1>
                                <contactInstructionsCA_RadiometryInSensor1>supplemental
                                instructions on how or when to contact the individual or
                                organization</contactInstructionsCA_RadiometryInSensor1>
                            </CI_ContactCA_RadiometryInSensor1>
                        </contactInfoCA_RadiometryInSensor1>

                        <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                        r1>
                    </CI_ResponsiblePartyCA_RadiometryInSensor1>
                </pointOfContactCA_RadiometryInSensor>
            </MD_IdentificationCA_RadiometryInSensor>
        </sensorSystemIdentification>
        <numberSensorHeads>1</numberSensorHeads>
        <measurementMethodMTF>definition of the measurement method for the determination of
        the modulation transfer function</measurementMethodMTF>
        <measurementMethodPSF>definition of the measurement method for the determination of
        the point spread function</measurementMethodPSF>
    </CA_SensorMeasurement>
    <CA_SensorParameters>
        <calibrationType>laboratory</calibrationType>
        <case>1</case>
        <numberOfPieces>0</numberOfPieces>
        <gain>0.0</gain>
        <offset>0.0</offset>
        <signOfGain>1</signOfGain>
        <minWavelength>0.0</minWavelength>
        <maxWavelength>0.0</maxWavelength>
        <b>0.0</b>
        <c>0.0</c>
        <sensorSystemIdentification>
            <MD_IdentificationCA_RadiometryInSensor>
                <citationCA_RadiometryInSensor>
                    <CI_CitationCA_RadiometryInSensor>
                        <titleCA_RadiometryInSensor>name by which the cited resource is
                        known</titleCA_RadiometryInSensor>
                        <alternateTitleCA_RadiometryInSensor>short name or other language
                        name by which the cited information is
                        known</alternateTitleCA_RadiometryInSensor>
                        <dateCA_RadiometryInSensor>
```

```
                    <CI_DateCA_RadiometryInSensor>

                        <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
                        diometryInSensor>

                        <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
                        InSensor>
                    </CI_DateCA_RadiometryInSensor>
                </dateCA_RadiometryInSensor>
                <editionCA_RadiometryInSensor>version of the cited
                resource</editionCA_RadiometryInSensor>
                <editionDateCA_RadiometryInSensor>

                    <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
                    A_RadiometryInSensor>
                </editionDateCA_RadiometryInSensor>
                <identifierCA_RadiometryInSensor>
                    <MD_IdentifierCA_RadiometryInSensor>
                        <authorityCA_RadiometryInSensor>person or party responsible
                        for maintenance of the
                        namespace</authorityCA_RadiometryInSensor>
                        <codeCA_RadiometryInSensor>alphanumeric value identifying an
                        instance in the namespace</codeCA_RadiometryInSensor>
                    </MD_IdentifierCA_RadiometryInSensor>
                </identifierCA_RadiometryInSensor>
                <citedResponsiblePartyCA_RadiometryInSensor>
                    <CI_ResponsiblePartyCA_RadiometryInSensor>
                        <individualNameCA_RadiometryInSensor>name of the responsible
                        person- surname,given name, title separated by a
                        delimiter</individualNameCA_RadiometryInSensor>
                        <organisationNameCA_RadiometryInSensor>name of the
                        responsible
                        organization</organisationNameCA_RadiometryInSensor>
                        <positionNameCA_RadiometryInSensor>role or position of the
                        responsible person</positionNameCA_RadiometryInSensor>
                        <contactInfoCA_RadiometryInSensor>
                            <CI_ContactCA_RadiometryInSensor>
                                <phoneCA_RadiometryInSensor>
                                    <CI_TelephoneCA_RadiometryInSensor>
                                        <voiceCA_RadiometryInSensor>telephone number
                                        by which individuals can speak to the
                                        responsible organization or
                                        individual</voiceCA_RadiometryInSensor>
                                        <facsimileCA_RadiometryInSensor>telephone
                                        number of a facsimile machine for the
                                        responsible organization or
                                        individual</facsimileCA_RadiometryInSensor>
                                    </CI_TelephoneCA_RadiometryInSensor>
                                </phoneCA_RadiometryInSensor>
                                <addressCA_RadiometryInSensor>
                                    <CI_AddressCA_RadiometryInSensor>
                                        <deliveryPointCA_RadiometryInSensor>address
                                        line for the
                                        location</deliveryPointCA_RadiometryInSensor>
                                        <cityCA_RadiometryInSensor>city of the
                                        location</cityCA_RadiometryInSensor>

                                        <administrativeAreaCA_RadiometryInSensor>state
                                        , province of the
                                        location</administrativeAreaCA_RadiometryInSen
                                        sor>
                                        <postalCodeCA_RadiometryInSensor>ZIP or
                                        other postal
                                        code</postalCodeCA_RadiometryInSensor>
                                        <countryCA_RadiometryInSensor>country of the
                                        physical
                                        address</countryCA_RadiometryInSensor>
```

```
                                <electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>
                            </CI_AddressCA_RadiometryInSensor>
                        </addressCA_RadiometryInSensor>
                        <onlineResourceCA_RadiometryInSensor>
                            <CI_OnlineResourceCA_RadiometryInSensor>
                                <linkageCA_RadiometryInSensor>location (address) for on-line access using a Uniform Resource Locator address or similar addressing scheme</linkageCA_RadiometryInSensor>
                                <protocolCA_RadiometryInSensor>connection protocol to be used</protocolCA_RadiometryInSensor>

                                <applicationProfileCA_RadiometryInSensor>name of an application profile that can be used with the online resource</applicationProfileCA_RadiometryInSensor>

                                <nameCI_OnlineResourceCA_RadiometryInSensor>name of the online resource</nameCI_OnlineResourceCA_RadiometryInSensor>

                                <descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>

                                <functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>
                            </CI_OnlineResourceCA_RadiometryInSensor>
                        </onlineResourceCA_RadiometryInSensor>
                        <hoursOfServiceCA_RadiometryInSensor>time period (including time zone) when individuals can contact the organization or individual</hoursOfServiceCA_RadiometryInSensor>

                        <contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to contact the individual or organization</contactInstructionsCA_RadiometryInSensor>
                    </CI_ContactCA_RadiometryInSensor>
                </contactInfoCA_RadiometryInSensor>

                <roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>
            </CI_ResponsiblePartyCA_RadiometryInSensor>
        </citedResponsiblePartyCA_RadiometryInSensor>

        <presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
        <seriesCA_RadiometryInSensor>
            <CI_SeriesCA_RadiometryInSensor>
                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>
                <issueIdentificationCA_RadiometryInSensor>information identifying the issue of the
```

```
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressCA_RadiometryInSensor
                                1>
                            </CI_AddressCA_RadiometryInSensor1>
                        </addressCA_RadiometryInSensor1>
```

```
                        <onlineResourceCA_RadiometryInSensor1>
                            <CI_OnlineResourceCA_RadiometryInSensor1>
                                <linkageCA_RadiometryInSensor1>location (address)
                                for on-line access using a Uniform Resource Locator
                                address or similar addressing
                                scheme</linkageCA_RadiometryInSensor1>
                                <protocolCA_RadiometryInSensor1>connection protocol
                                to be used</protocolCA_RadiometryInSensor1>
                                <applicationProfileCA_RadiometryInSensor1>name of an
                                application profile that can be used with the online
                                resource</applicationProfileCA_RadiometryInSensor1>
                                <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                the online
                                resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                tailed text description of what the online resource
                                is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                nsor1>

                                <functionCA_RadiometryInSensor1>download</functionCA_R
                                adiometryInSensor1>
                            </CI_OnlineResourceCA_RadiometryInSensor1>
                        </onlineResourceCA_RadiometryInSensor1>
                        <hoursOfServiceCA_RadiometryInSensor1>time period (including
                        time zone) when individuals can contact the organization or
                        individual</hoursOfServiceCA_RadiometryInSensor1>
                        <contactInstructionsCA_RadiometryInSensor1>supplemental
                        instructions on how or when to contact the individual or
                        organization</contactInstructionsCA_RadiometryInSensor1>
                    </CI_ContactCA_RadiometryInSensor1>
                </contactInfoCA_RadiometryInSensor1>

                <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                r1>
            </CI_ResponsiblePartyCA_RadiometryInSensor1>
        </pointOfContactCA_RadiometryInSensor>
    </MD_IdentificationCA_RadiometryInSensor>
</sensorSystemIdentification>
<numberSensorHeads>1</numberSensorHeads>
<sensorIdentification>
    <MD_IdentificationCA_SensorCharacteristics>
        <citationCA_SensorCharacteristics>
            <CI_CitationCA_SensorCharacteristics>
                <titleCA_SensorCharacteristics>name by which the cited resource is
                known</titleCA_SensorCharacteristics>
                <alternateTitleCA_SensorCharacteristics>short name or other language
                name by which the cited information is
                known</alternateTitleCA_SensorCharacteristics>
                <dateCA_SensorCharacteristics>
                    <CI_DateCA_SensorCharacteristics>

                        <dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA
                        _SensorCharacteristics>

                        <dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorC
                        haracteristics>
                    </CI_DateCA_SensorCharacteristics>
                </dateCA_SensorCharacteristics>
                <editionCA_SensorCharacteristics>version of the cited
                resource</editionCA_SensorCharacteristics>
                <editionDateCA_SensorCharacteristics>

                    <dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDa
                    teCA_SensorCharacteristics>
                </editionDateCA_SensorCharacteristics>
                <identifierCA_SensorCharacteristics>
```

```
                    <MD_IdentifierCA_SensorCharacteristics>
                        <authorityCA_SensorCharacteristics>person or party
                        responsible for maintenance of the
                        namespace</authorityCA_SensorCharacteristics>
                        <codeCA_SensorCharacteristics>alphanumeric value identifying
                        an instance in the namespace</codeCA_SensorCharacteristics>
                    </MD_IdentifierCA_SensorCharacteristics>
                </identifierCA_SensorCharacteristics>
                <citedResponsiblePartyCA_SensorCharacteristics>
                    <CI_ResponsiblePartyCA_SensorCharacteristics>
                        <individualNameCA_SensorCharacteristics>name of the
                        responsible person- surname,given name, title separated by a
                        delimiter</individualNameCA_SensorCharacteristics>
                        <organisationNameCA_SensorCharacteristics>name of the
                        responsible
                        organization</organisationNameCA_SensorCharacteristics>
                        <positionNameCA_SensorCharacteristics>role or position of
                        the responsible person</positionNameCA_SensorCharacteristics>
                        <contactInfoCA_SensorCharacteristics>
                            <CI_ContactCA_SensorCharacteristics>
                                <phoneCA_SensorCharacteristics>
                                    <CI_TelephoneCA_SensorCharacteristics>
                                        <voiceCA_SensorCharacteristics>telephone
                                        number by which individuals can speak to the
                                        responsible organization or
                                        individual</voiceCA_SensorCharacteristics>
                                        <facsimileCA_SensorCharacteristics>telephone
                                        number of a facsimile machine for the
                                        responsible organization or
                                        individual</facsimileCA_SensorCharacteristics>
                                    </CI_TelephoneCA_SensorCharacteristics>
                                </phoneCA_SensorCharacteristics>
                                <addressCA_SensorCharacteristics>
                                    <CI_AddressCA_SensorCharacteristics>

                                        <deliveryPointCA_SensorCharacteristics>address
                                         line for the
                                        location</deliveryPointCA_SensorCharacteristic
                                        s>
                                        <cityCA_SensorCharacteristics>city of the
                                        location</cityCA_SensorCharacteristics>

                                        <administrativeAreaCA_SensorCharacteristics>st
                                        ate, province of the
                                        location</administrativeAreaCA_SensorCharacter
                                        istics>
                                        <postalCodeCA_SensorCharacteristics>ZIP or
                                        other postal
                                        code</postalCodeCA_SensorCharacteristics>
                                        <countryCA_SensorCharacteristics>country of
                                        the physical
                                        address</countryCA_SensorCharacteristics>

                                        <electronicMailAddressCA_SensorCharacteristics
                                        >telephone number of a facsimile machine for
                                        the responsible organization or
                                        individual</electronicMailAddressCA_SensorChar
                                        acteristics>
                                    </CI_AddressCA_SensorCharacteristics>
                                </addressCA_SensorCharacteristics>
                                <onlineResourceCA_SensorCharacteristics>
                                    <CI_OnlineResourceCA_SensorCharacteristics>
                                        <linkageCA_SensorCharacteristics>location
                                        (address) for on-line access using a Uniform
                                        Resource Locator address or similar
                                        addressing
                                        scheme</linkageCA_SensorCharacteristics>
```

```
                                    <protocolCA_SensorCharacteristics>connection
                                    protocol to be
                                    used</protocolCA_SensorCharacteristics>

                                    <applicationProfileCA_SensorCharacteristics>na
                                    me of an application profile that can be
                                    used with the online
                                    resource</applicationProfileCA_SensorCharacter
                                    istics>

                                    <nameCI_OnlineResourceCA_SensorCharacteristics
                                    >name of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharac
                                    teristics>

                                    <descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics>detailed text description of what
                                    the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Sensor
                                    Characteristics>

                                    <functionCA_SensorCharacteristics>download</fu
                                    nctionCA_SensorCharacteristics>
                                </CI_OnlineResourceCA_SensorCharacteristics>
                            </onlineResourceCA_SensorCharacteristics>
                            <hoursOfServiceCA_SensorCharacteristics>time period
                            (including time zone) when individuals can contact
                            the organization or
                            individual</hoursOfServiceCA_SensorCharacteristics>

                            <contactInstructionsCA_SensorCharacteristics>supplemen
                            tal instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_SensorCharacterist
                            ics>
                        </CI_ContactCA_SensorCharacteristics>
                    </contactInfoCA_SensorCharacteristics>

                    <roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorC
                    haracteristics>
                </CI_ResponsiblePartyCA_SensorCharacteristics>
            </citedResponsiblePartyCA_SensorCharacteristics>

            <presentationFormCA_SensorCharacteristics>documentDigital</presentatio
            nFormCA_SensorCharacteristics>
            <seriesCA_SensorCharacteristics>
                <CI_SeriesCA_SensorCharacteristics>
                    <nameCI_SeriesCA_SensorCharacteristics>name of the series,
                    or aggregate dataset, of which the dataset is a
                    part</nameCI_SeriesCA_SensorCharacteristics>
                    <issueIdentificationCA_SensorCharacteristics>information
                    identifying the issue of the
                    series</issueIdentificationCA_SensorCharacteristics>
                    <pageCA_SensorCharacteristics>details on which pages of the
                    publication the article was
                    published</pageCA_SensorCharacteristics>
                </CI_SeriesCA_SensorCharacteristics>
            </seriesCA_SensorCharacteristics>
            <otherCitationDetailsCA_SensorCharacteristics>other information
            required to complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_SensorCharacteristics>
            <collectiveTitleCA_SensorCharacteristics>common title with holdings
            note</collectiveTitleCA_SensorCharacteristics>
            <ISBNCA_SensorCharacteristics>international Standard Book
            Number</ISBNCA_SensorCharacteristics>
            <ISSNCA_SensorCharacteristics>international Standard Serial
            Number</ISSNCA_SensorCharacteristics>
```

```
        </CI_CitationCA_SensorCharacteristics>
    </citationCA_SensorCharacteristics>
    <abstractCA_SensorCharacteristics>brief narrative summary of the content of
    the resource(s)</abstractCA_SensorCharacteristics>
    <purposeCA_SensorCharacteristics>summary of the intentions with which the
    resource(s) was developed</purposeCA_SensorCharacteristics>
    <creditCA_SensorCharacteristics>recognition of those who contributed to the
    resource(s)</creditCA_SensorCharacteristics>
    <statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>
    <pointOfContactCA_SensorCharacteristics>
        <CI_ResponsiblePartyCA_SensorCharacteristics1>
            <individualNameCA_SensorCharacteristics1>name of the responsible
            person- surname,given name, title separated by a
            delimiter</individualNameCA_SensorCharacteristics1>
            <organisationNameCA_SensorCharacteristics1>name of the responsible
            organization</organisationNameCA_SensorCharacteristics1>
            <positionNameCA_SensorCharacteristics1>role or position of the
            responsible person</positionNameCA_SensorCharacteristics1>
            <contactInfoCA_SensorCharacteristics1>
                <CI_ContactCA_SensorCharacteristics1>
                    <phoneCA_SensorCharacteristics1>
                        <CI_TelephoneCA_SensorCharacteristics1>
                            <voiceCA_SensorCharacteristics1>telephone number by
                            which individuals can speak to the responsible
                            organization or
                            individual</voiceCA_SensorCharacteristics1>
                            <facsimileCA_SensorCharacteristics1>telephone number
                            of a facsimile machine for the responsible
                            organization or
                            individual</facsimileCA_SensorCharacteristics1>
                        </CI_TelephoneCA_SensorCharacteristics1>
                    </phoneCA_SensorCharacteristics1>
                    <addressCA_SensorCharacteristics1>
                        <CI_AddressCA_SensorCharacteristics1>
                            <deliveryPointCA_SensorCharacteristics1>address line
                            for the
                            location</deliveryPointCA_SensorCharacteristics1>
                            <cityCA_SensorCharacteristics1>city of the
                            location</cityCA_SensorCharacteristics1>
                            <administrativeAreaCA_SensorCharacteristics1>state,
                            province of the
                            location</administrativeAreaCA_SensorCharacteristics1>
                            <postalCodeCA_SensorCharacteristics1>ZIP or other
                            postal code</postalCodeCA_SensorCharacteristics1>
                            <countryCA_SensorCharacteristics1>country of the
                            physical address</countryCA_SensorCharacteristics1>

                            <electronicMailAddressCA_SensorCharacteristics1>teleph
                            one number of a facsimile machine for the
                            responsible organization or
                            individual</electronicMailAddressCA_SensorCharacterist
                            ics1>
                        </CI_AddressCA_SensorCharacteristics1>
                    </addressCA_SensorCharacteristics1>
                    <onlineResourceCA_SensorCharacteristics1>
                        <CI_OnlineResourceCA_SensorCharacteristics1>
                            <linkageCA_SensorCharacteristics1>location (address)
                            for on-line access using a Uniform Resource Locator
                            address or similar addressing
                            scheme</linkageCA_SensorCharacteristics1>
                            <protocolCA_SensorCharacteristics1>connection
                            protocol to be
                            used</protocolCA_SensorCharacteristics1>
                            <applicationProfileCA_SensorCharacteristics1>name of
                            an application profile that can be used with the
                            online
                            resource</applicationProfileCA_SensorCharacteristics1>
```

```
                                    <nameCI_OnlineResourceCA_SensorCharacteristics1>name
                                    of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharacteristic
                                    s1>

                                    <descriptionCI_OnlineResourceCA_SensorCharacteristics1
                                    >detailed text description of what the online
                                    resource
                                    is/does</descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics1>

                                    <functionCA_SensorCharacteristics1>download</functionC
                                    A_SensorCharacteristics1>
                                </CI_OnlineResourceCA_SensorCharacteristics1>
                            </onlineResourceCA_SensorCharacteristics1>
                            <hoursOfServiceCA_SensorCharacteristics1>time period
                            (including time zone) when individuals can contact the
                            organization or
                            individual</hoursOfServiceCA_SensorCharacteristics1>
                            <contactInstructionsCA_SensorCharacteristics1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_SensorCharacteristics1>
                        </CI_ContactCA_SensorCharacteristics1>
                    </contactInfoCA_SensorCharacteristics1>

                    <roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacte
                    ristics1>
                </CI_ResponsiblePartyCA_SensorCharacteristics1>
            </pointOfContactCA_SensorCharacteristics>
        </MD_IdentificationCA_SensorCharacteristics>
    </sensorIdentification>
    <cameraHead>camera or sensor head for which the information is valid</cameraHead>
    <channel>channel for which the information is valid</channel>
    <pointSpreadFunction>
        <CA_PointSpreadFunctionCA_SensorParameters>

            <shapeCA_PointSpreadFunctionCA_SensorParameters>square</shapeCA_PointSpreadFun
            ctionCA_SensorParameters>
            <spreadingCA_SensorParameters>characteristic parameters or as a discrete
            function</spreadingCA_SensorParameters>
        </CA_PointSpreadFunctionCA_SensorParameters>
    </pointSpreadFunction>
    <fNumberDenominator>1</fNumberDenominator>
    <samplingPattern>square</samplingPattern>
    <spectralResponse>
        <CA_SpectrumCA_SensorParameters>
            <numberBandsCA_SensorParameters>0</numberBandsCA_SensorParameters>
            <wavelengthCA_SpectrumCA_SensorParameters
            uom="#m">0.0</wavelengthCA_SpectrumCA_SensorParameters>
            <responseCA_SensorParameters>0.0</responseCA_SensorParameters>
        </CA_SpectrumCA_SensorParameters>
    </spectralResponse>
</CA_SensorParameters>
<CA_SensorPostProcessing>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
    <maxWavelength>0.0</maxWavelength>
    <b>0.0</b>
    <c>0.0</c>
    <sensorSystemIdentification>
        <MD_IdentificationCA_RadiometryInSensor>
            <citationCA_RadiometryInSensor>
```

```
<CI_CitationCA_RadiometryInSensor>
    <titleCA_RadiometryInSensor>name by which the cited resource is
    known</titleCA_RadiometryInSensor>
    <alternateTitleCA_RadiometryInSensor>short name or other language
    name by which the cited information is
    known</alternateTitleCA_RadiometryInSensor>
    <dateCA_RadiometryInSensor>
        <CI_DateCA_RadiometryInSensor>

            <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
            diometryInSensor>

            <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
            InSensor>
        </CI_DateCA_RadiometryInSensor>
    </dateCA_RadiometryInSensor>
    <editionCA_RadiometryInSensor>version of the cited
    resource</editionCA_RadiometryInSensor>
    <editionDateCA_RadiometryInSensor>

        <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
        A_RadiometryInSensor>
    </editionDateCA_RadiometryInSensor>
    <identifierCA_RadiometryInSensor>
        <MD_IdentifierCA_RadiometryInSensor>
            <authorityCA_RadiometryInSensor>person or party responsible
            for maintenance of the
            namespace</authorityCA_RadiometryInSensor>
            <codeCA_RadiometryInSensor>alphanumeric value identifying an
            instance in the namespace</codeCA_RadiometryInSensor>
        </MD_IdentifierCA_RadiometryInSensor>
    </identifierCA_RadiometryInSensor>
    <citedResponsiblePartyCA_RadiometryInSensor>
        <CI_ResponsiblePartyCA_RadiometryInSensor>
            <individualNameCA_RadiometryInSensor>name of the responsible
            person- surname,given name, title separated by a
            delimiter</individualNameCA_RadiometryInSensor>
            <organisationNameCA_RadiometryInSensor>name of the
            responsible
            organization</organisationNameCA_RadiometryInSensor>
            <positionNameCA_RadiometryInSensor>role or position of the
            responsible person</positionNameCA_RadiometryInSensor>
            <contactInfoCA_RadiometryInSensor>
                <CI_ContactCA_RadiometryInSensor>
                    <phoneCA_RadiometryInSensor>
                        <CI_TelephoneCA_RadiometryInSensor>
                            <voiceCA_RadiometryInSensor>telephone number
                            by which individuals can speak to the
                            responsible organization or
                            individual</voiceCA_RadiometryInSensor>
                            <facsimileCA_RadiometryInSensor>telephone
                            number of a facsimile machine for the
                            responsible organization or
                            individual</facsimileCA_RadiometryInSensor>
                        </CI_TelephoneCA_RadiometryInSensor>
                    </phoneCA_RadiometryInSensor>
                    <addressCA_RadiometryInSensor>
                        <CI_AddressCA_RadiometryInSensor>
                            <deliveryPointCA_RadiometryInSensor>address
                            line for the
                            location</deliveryPointCA_RadiometryInSensor>
                            <cityCA_RadiometryInSensor>city of the
                            location</cityCA_RadiometryInSensor>

                            <administrativeAreaCA_RadiometryInSensor>state
                            , province of the
                            location</administrativeAreaCA_RadiometryInSen
```

```
                                    sor>
                                    <postalCodeCA_RadiometryInSensor>ZIP or
                                    other postal
                                    code</postalCodeCA_RadiometryInSensor>
                                    <countryCA_RadiometryInSensor>country of the
                                    physical
                                    address</countryCA_RadiometryInSensor>

                                    <electronicMailAddressCA_RadiometryInSensor>te
                                    lephone number of a facsimile machine for
                                    the responsible organization or
                                    individual</electronicMailAddressCA_Radiometry
                                    InSensor>
                                </CI_AddressCA_RadiometryInSensor>
                            </addressCA_RadiometryInSensor>
                            <onlineResourceCA_RadiometryInSensor>
                                <CI_OnlineResourceCA_RadiometryInSensor>
                                    <linkageCA_RadiometryInSensor>location
                                    (address) for on-line access using a Uniform
                                    Resource Locator address or similar
                                    addressing
                                    scheme</linkageCA_RadiometryInSensor>
                                    <protocolCA_RadiometryInSensor>connection
                                    protocol to be
                                    used</protocolCA_RadiometryInSensor>

                                    <applicationProfileCA_RadiometryInSensor>name
                                    of an application profile that can be used
                                    with the online
                                    resource</applicationProfileCA_RadiometryInSen
                                    sor>

                                    <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                    me of the online
                                    resource</nameCI_OnlineResourceCA_RadiometryIn
                                    Sensor>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor>detailed text description of what the
                                    online resource
                                    is/does</descriptionCI_OnlineResourceCA_Radiom
                                    etryInSensor>

                                    <functionCA_RadiometryInSensor>download</funct
                                    ionCA_RadiometryInSensor>
                                </CI_OnlineResourceCA_RadiometryInSensor>
                            </onlineResourceCA_RadiometryInSensor>
                            <hoursOfServiceCA_RadiometryInSensor>time period
                            (including time zone) when individuals can contact
                            the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor>

                            <contactInstructionsCA_RadiometryInSensor>supplemental
                             instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_RadiometryInSensor
                            >
                        </CI_ContactCA_RadiometryInSensor>
                    </contactInfoCA_RadiometryInSensor>

                    <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                    InSensor>
                </CI_ResponsiblePartyCA_RadiometryInSensor>
            </citedResponsiblePartyCA_RadiometryInSensor>

            <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
            rmCA_RadiometryInSensor>
```

```
                    <seriesCA_RadiometryInSensor>
                        <CI_SeriesCA_RadiometryInSensor>
                            <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
                            aggregate dataset, of which the dataset is a
                            part</nameCI_SeriesCA_RadiometryInSensor>
                            <issueIdentificationCA_RadiometryInSensor>information
                            identifying the issue of the
                            series</issueIdentificationCA_RadiometryInSensor>
                            <pageCA_RadiometryInSensor>details on which pages of the
                            publication the article was
                            published</pageCA_RadiometryInSensor>
                        </CI_SeriesCA_RadiometryInSensor>
                    </seriesCA_RadiometryInSensor>
                    <otherCitationDetailsCA_RadiometryInSensor>other information
                    required to complete the citation that is not recorded
                    elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                    <collectiveTitleCA_RadiometryInSensor>common title with holdings
                    note</collectiveTitleCA_RadiometryInSensor>
                    <ISBNCA_RadiometryInSensor>international Standard Book
                    Number</ISBNCA_RadiometryInSensor>
                    <ISSNCA_RadiometryInSensor>international Standard Serial
                    Number</ISSNCA_RadiometryInSensor>
                </CI_CitationCA_RadiometryInSensor>
            </citationCA_RadiometryInSensor>
            <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
            resource(s)</abstractCA_RadiometryInSensor>
            <purposeCA_RadiometryInSensor>summary of the intentions with which the
            resource(s) was developed</purposeCA_RadiometryInSensor>
            <creditCA_RadiometryInSensor>recognition of those who contributed to the
            resource(s)</creditCA_RadiometryInSensor>
            <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
            <pointOfContactCA_RadiometryInSensor>
                <CI_ResponsiblePartyCA_RadiometryInSensor1>
                    <individualNameCA_RadiometryInSensor1>name of the responsible
                    person- surname,given name, title separated by a
                    delimiter</individualNameCA_RadiometryInSensor1>
                    <organisationNameCA_RadiometryInSensor1>name of the responsible
                    organization</organisationNameCA_RadiometryInSensor1>
                    <positionNameCA_RadiometryInSensor1>role or position of the
                    responsible person</positionNameCA_RadiometryInSensor1>
                    <contactInfoCA_RadiometryInSensor1>
                        <CI_ContactCA_RadiometryInSensor1>
                            <phoneCA_RadiometryInSensor1>
                                <CI_TelephoneCA_RadiometryInSensor1>
                                    <voiceCA_RadiometryInSensor1>telephone number by
                                    which individuals can speak to the responsible
                                    organization or
                                    individual</voiceCA_RadiometryInSensor1>
                                    <facsimileCA_RadiometryInSensor1>telephone number of
                                    a facsimile machine for the responsible organization
                                    or individual</facsimileCA_RadiometryInSensor1>
                                </CI_TelephoneCA_RadiometryInSensor1>
                            </phoneCA_RadiometryInSensor1>
                            <addressCA_RadiometryInSensor1>
                                <CI_AddressCA_RadiometryInSensor1>
                                    <deliveryPointCA_RadiometryInSensor1>address line
                                    for the location</deliveryPointCA_RadiometryInSensor1>
                                    <cityCA_RadiometryInSensor1>city of the
                                    location</cityCA_RadiometryInSensor1>
                                    <administrativeAreaCA_RadiometryInSensor1>state,
                                    province of the
                                    location</administrativeAreaCA_RadiometryInSensor1>
                                    <postalCodeCA_RadiometryInSensor1>ZIP or other
                                    postal code</postalCodeCA_RadiometryInSensor1>
                                    <countryCA_RadiometryInSensor1>country of the
                                    physical address</countryCA_RadiometryInSensor1>
```

```
                                    <electronicMailAddressCA_RadiometryInSensor1>telephone
                                     number of a facsimile machine for the responsible
                                    organization or
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <colourTransformation>coefficients that are used to perform a colour
    transformation</colourTransformation>
</CA_SensorPostProcessing>
<CA_SensorQualityEvaluation>
    <calibrationType>laboratory</calibrationType>
    <case>1</case>
    <numberOfPieces>0</numberOfPieces>
    <gain>0.0</gain>
    <offset>0.0</offset>
    <signOfGain>1</signOfGain>
    <minWavelength>0.0</minWavelength>
    <maxWavelength>0.0</maxWavelength>
    <b>0.0</b>
    <c>0.0</c>
    <sensorSystemIdentification>
        <MD_IdentificationCA_RadiometryInSensor>
            <citationCA_RadiometryInSensor>
                <CI_CitationCA_RadiometryInSensor>
                    <titleCA_RadiometryInSensor>name by which the cited resource is
                    known</titleCA_RadiometryInSensor>
```

```
<alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is
known</alternateTitleCA_RadiometryInSensor>
<dateCA_RadiometryInSensor>
    <CI_DateCA_RadiometryInSensor>

        <dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_Ra
        diometryInSensor>

        <dateTypeCA_RadiometryInSensor>creation</dateTypeCA_Radiometry
        InSensor>
    </CI_DateCA_RadiometryInSensor>
</dateCA_RadiometryInSensor>
<editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>
<editionDateCA_RadiometryInSensor>

    <dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateC
    A_RadiometryInSensor>
</editionDateCA_RadiometryInSensor>
<identifierCA_RadiometryInSensor>
    <MD_IdentifierCA_RadiometryInSensor>
        <authorityCA_RadiometryInSensor>person or party responsible
        for maintenance of the
        namespace</authorityCA_RadiometryInSensor>
        <codeCA_RadiometryInSensor>alphanumeric value identifying an
        instance in the namespace</codeCA_RadiometryInSensor>
    </MD_IdentifierCA_RadiometryInSensor>
</identifierCA_RadiometryInSensor>
<citedResponsiblePartyCA_RadiometryInSensor>
    <CI_ResponsiblePartyCA_RadiometryInSensor>
        <individualNameCA_RadiometryInSensor>name of the responsible
        person- surname,given name, title separated by a
        delimiter</individualNameCA_RadiometryInSensor>
        <organisationNameCA_RadiometryInSensor>name of the
        responsible
        organization</organisationNameCA_RadiometryInSensor>
        <positionNameCA_RadiometryInSensor>role or position of the
        responsible person</positionNameCA_RadiometryInSensor>
        <contactInfoCA_RadiometryInSensor>
            <CI_ContactCA_RadiometryInSensor>
                <phoneCA_RadiometryInSensor>
                    <CI_TelephoneCA_RadiometryInSensor>
                        <voiceCA_RadiometryInSensor>telephone number
                        by which individuals can speak to the
                        responsible organization or
                        individual</voiceCA_RadiometryInSensor>
                        <facsimileCA_RadiometryInSensor>telephone
                        number of a facsimile machine for the
                        responsible organization or
                        individual</facsimileCA_RadiometryInSensor>
                    </CI_TelephoneCA_RadiometryInSensor>
                </phoneCA_RadiometryInSensor>
                <addressCA_RadiometryInSensor>
                    <CI_AddressCA_RadiometryInSensor>
                        <deliveryPointCA_RadiometryInSensor>address
                        line for the
                        location</deliveryPointCA_RadiometryInSensor>
                        <cityCA_RadiometryInSensor>city of the
                        location</cityCA_RadiometryInSensor>

                        <administrativeAreaCA_RadiometryInSensor>state
                        , province of the
                        location</administrativeAreaCA_RadiometryInSen
                        sor>
                        <postalCodeCA_RadiometryInSensor>ZIP or
                        other postal
```

```
                                code</postalCodeCA_RadiometryInSensor>
                                <countryCA_RadiometryInSensor>country of the
                                physical
                                address</countryCA_RadiometryInSensor>

                                <electronicMailAddressCA_RadiometryInSensor>te
                                lephone number of a facsimile machine for
                                the responsible organization or
                                individual</electronicMailAddressCA_Radiometry
                                InSensor>
                            </CI_AddressCA_RadiometryInSensor>
                        </addressCA_RadiometryInSensor>
                        <onlineResourceCA_RadiometryInSensor>
                            <CI_OnlineResourceCA_RadiometryInSensor>
                                <linkageCA_RadiometryInSensor>location
                                (address) for on-line access using a Uniform
                                Resource Locator address or similar
                                addressing
                                scheme</linkageCA_RadiometryInSensor>
                                <protocolCA_RadiometryInSensor>connection
                                protocol to be
                                used</protocolCA_RadiometryInSensor>

                                <applicationProfileCA_RadiometryInSensor>name
                                of an application profile that can be used
                                with the online
                                resource</applicationProfileCA_RadiometryInSen
                                sor>

                                <nameCI_OnlineResourceCA_RadiometryInSensor>na
                                me of the online
                                resource</nameCI_OnlineResourceCA_RadiometryIn
                                Sensor>

                                <descriptionCI_OnlineResourceCA_RadiometryInSe
                                nsor>detailed text description of what the
                                online resource
                                is/does</descriptionCI_OnlineResourceCA_Radiom
                                etryInSensor>

                                <functionCA_RadiometryInSensor>download</funct
                                ionCA_RadiometryInSensor>
                            </CI_OnlineResourceCA_RadiometryInSensor>
                        </onlineResourceCA_RadiometryInSensor>
                        <hoursOfServiceCA_RadiometryInSensor>time period
                        (including time zone) when individuals can contact
                        the organization or
                        individual</hoursOfServiceCA_RadiometryInSensor>

                        <contactInstructionsCA_RadiometryInSensor>supplemental
                         instructions on how or when to contact the
                        individual or
                        organization</contactInstructionsCA_RadiometryInSensor
                        >
                    </CI_ContactCA_RadiometryInSensor>
                </contactInfoCA_RadiometryInSensor>

                <roleCA_RadiometryInSensor>resourceProvider</roleCA_Radiometry
                InSensor>
            </CI_ResponsiblePartyCA_RadiometryInSensor>
        </citedResponsiblePartyCA_RadiometryInSensor>

        <presentationFormCA_RadiometryInSensor>documentDigital</presentationFo
        rmCA_RadiometryInSensor>
        <seriesCA_RadiometryInSensor>
            <CI_SeriesCA_RadiometryInSensor>
                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
```

```
                        aggregate dataset, of which the dataset is a
                        part</nameCI_SeriesCA_RadiometryInSensor>
                        <issueIdentificationCA_RadiometryInSensor>information
                        identifying the issue of the
                        series</issueIdentificationCA_RadiometryInSensor>
                        <pageCA_RadiometryInSensor>details on which pages of the
                        publication the article was
                        published</pageCA_RadiometryInSensor>
                    </CI_SeriesCA_RadiometryInSensor>
                </seriesCA_RadiometryInSensor>
                <otherCitationDetailsCA_RadiometryInSensor>other information
                required to complete the citation that is not recorded
                elsewhere</otherCitationDetailsCA_RadiometryInSensor>
                <collectiveTitleCA_RadiometryInSensor>common title with holdings
                note</collectiveTitleCA_RadiometryInSensor>
                <ISBNCA_RadiometryInSensor>international Standard Book
                Number</ISBNCA_RadiometryInSensor>
                <ISSNCA_RadiometryInSensor>international Standard Serial
                Number</ISSNCA_RadiometryInSensor>
            </CI_CitationCA_RadiometryInSensor>
        </citationCA_RadiometryInSensor>
        <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
        resource(s)</abstractCA_RadiometryInSensor>
        <purposeCA_RadiometryInSensor>summary of the intentions with which the
        resource(s) was developed</purposeCA_RadiometryInSensor>
        <creditCA_RadiometryInSensor>recognition of those who contributed to the
        resource(s)</creditCA_RadiometryInSensor>
        <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>
        <pointOfContactCA_RadiometryInSensor>
            <CI_ResponsiblePartyCA_RadiometryInSensor1>
                <individualNameCA_RadiometryInSensor1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_RadiometryInSensor1>
                <organisationNameCA_RadiometryInSensor1>name of the responsible
                organization</organisationNameCA_RadiometryInSensor1>
                <positionNameCA_RadiometryInSensor1>role or position of the
                responsible person</positionNameCA_RadiometryInSensor1>
                <contactInfoCA_RadiometryInSensor1>
                    <CI_ContactCA_RadiometryInSensor1>
                        <phoneCA_RadiometryInSensor1>
                            <CI_TelephoneCA_RadiometryInSensor1>
                                <voiceCA_RadiometryInSensor1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_RadiometryInSensor1>
                                <facsimileCA_RadiometryInSensor1>telephone number of
                                a facsimile machine for the responsible organization
                                or individual</facsimileCA_RadiometryInSensor1>
                            </CI_TelephoneCA_RadiometryInSensor1>
                        </phoneCA_RadiometryInSensor1>
                        <addressCA_RadiometryInSensor1>
                            <CI_AddressCA_RadiometryInSensor1>
                                <deliveryPointCA_RadiometryInSensor1>address line
                                for the location</deliveryPointCA_RadiometryInSensor1>
                                <cityCA_RadiometryInSensor1>city of the
                                location</cityCA_RadiometryInSensor1>
                                <administrativeAreaCA_RadiometryInSensor1>state,
                                province of the
                                location</administrativeAreaCA_RadiometryInSensor1>
                                <postalCodeCA_RadiometryInSensor1>ZIP or other
                                postal code</postalCodeCA_RadiometryInSensor1>
                                <countryCA_RadiometryInSensor1>country of the
                                physical address</countryCA_RadiometryInSensor1>

                                <electronicMailAddressCA_RadiometryInSensor1>telephone
                                 number of a facsimile machine for the responsible
                                organization or
```

```
                                    individual</electronicMailAddressCA_RadiometryInSensor
                                    1>
                                </CI_AddressCA_RadiometryInSensor1>
                            </addressCA_RadiometryInSensor1>
                            <onlineResourceCA_RadiometryInSensor1>
                                <CI_OnlineResourceCA_RadiometryInSensor1>
                                    <linkageCA_RadiometryInSensor1>location (address)
                                    for on-line access using a Uniform Resource Locator
                                    address or similar addressing
                                    scheme</linkageCA_RadiometryInSensor1>
                                    <protocolCA_RadiometryInSensor1>connection protocol
                                    to be used</protocolCA_RadiometryInSensor1>
                                    <applicationProfileCA_RadiometryInSensor1>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileCA_RadiometryInSensor1>
                                    <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
                                    the online
                                    resource</nameCI_OnlineResourceCA_RadiometryInSensor1>

                                    <descriptionCI_OnlineResourceCA_RadiometryInSensor1>de
                                    tailed text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceCA_RadiometryInSe
                                    nsor1>

                                    <functionCA_RadiometryInSensor1>download</functionCA_R
                                    adiometryInSensor1>
                                </CI_OnlineResourceCA_RadiometryInSensor1>
                            </onlineResourceCA_RadiometryInSensor1>
                            <hoursOfServiceCA_RadiometryInSensor1>time period (including
                            time zone) when individuals can contact the organization or
                            individual</hoursOfServiceCA_RadiometryInSensor1>
                            <contactInstructionsCA_RadiometryInSensor1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_RadiometryInSensor1>
                        </CI_ContactCA_RadiometryInSensor1>
                    </contactInfoCA_RadiometryInSensor1>

                    <roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSenso
                    r1>
                </CI_ResponsiblePartyCA_RadiometryInSensor1>
            </pointOfContactCA_RadiometryInSensor>
        </MD_IdentificationCA_RadiometryInSensor>
    </sensorSystemIdentification>
    <numberSensorHeads>1</numberSensorHeads>
    <sensorIdentification>
        <MD_IdentificationCA_SensorCharacteristics>
            <citationCA_SensorCharacteristics>
                <CI_CitationCA_SensorCharacteristics>
                    <titleCA_SensorCharacteristics>name by which the cited resource is
                    known</titleCA_SensorCharacteristics>
                    <alternateTitleCA_SensorCharacteristics>short name or other language
                    name by which the cited information is
                    known</alternateTitleCA_SensorCharacteristics>
                    <dateCA_SensorCharacteristics>
                        <CI_DateCA_SensorCharacteristics>

                            <dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA
                            _SensorCharacteristics>

                            <dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorC
                            haracteristics>
                        </CI_DateCA_SensorCharacteristics>
                    </dateCA_SensorCharacteristics>
                    <editionCA_SensorCharacteristics>version of the cited
                    resource</editionCA_SensorCharacteristics>
                    <editionDateCA_SensorCharacteristics>
```

```
                    <dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDa
                    teCA_SensorCharacteristics>
                </editionDateCA_SensorCharacteristics>
                <identifierCA_SensorCharacteristics>
                    <MD_IdentifierCA_SensorCharacteristics>
                        <authorityCA_SensorCharacteristics>person or party
                        responsible for maintenance of the
                        namespace</authorityCA_SensorCharacteristics>
                        <codeCA_SensorCharacteristics>alphanumeric value identifying
                        an instance in the namespace</codeCA_SensorCharacteristics>
                    </MD_IdentifierCA_SensorCharacteristics>
                </identifierCA_SensorCharacteristics>
                <citedResponsiblePartyCA_SensorCharacteristics>
                    <CI_ResponsiblePartyCA_SensorCharacteristics>
                        <individualNameCA_SensorCharacteristics>name of the
                        responsible person- surname,given name, title separated by a
                        delimiter</individualNameCA_SensorCharacteristics>
                        <organisationNameCA_SensorCharacteristics>name of the
                        responsible
                        organization</organisationNameCA_SensorCharacteristics>
                        <positionNameCA_SensorCharacteristics>role or position of
                        the responsible person</positionNameCA_SensorCharacteristics>
                        <contactInfoCA_SensorCharacteristics>
                            <CI_ContactCA_SensorCharacteristics>
                                <phoneCA_SensorCharacteristics>
                                    <CI_TelephoneCA_SensorCharacteristics>
                                        <voiceCA_SensorCharacteristics>telephone
                                        number by which individuals can speak to the
                                        responsible organization or
                                        individual</voiceCA_SensorCharacteristics>
                                        <facsimileCA_SensorCharacteristics>telephone
                                        number of a facsimile machine for the
                                        responsible organization or
                                        individual</facsimileCA_SensorCharacteristics>
                                    </CI_TelephoneCA_SensorCharacteristics>
                                </phoneCA_SensorCharacteristics>
                                <addressCA_SensorCharacteristics>
                                    <CI_AddressCA_SensorCharacteristics>

                                        <deliveryPointCA_SensorCharacteristics>address
                                         line for the
                                        location</deliveryPointCA_SensorCharacteristic
                                        s>
                                        <cityCA_SensorCharacteristics>city of the
                                        location</cityCA_SensorCharacteristics>

                                        <administrativeAreaCA_SensorCharacteristics>st
                                        ate, province of the
                                        location</administrativeAreaCA_SensorCharacter
                                        istics>
                                        <postalCodeCA_SensorCharacteristics>ZIP or
                                        other postal
                                        code</postalCodeCA_SensorCharacteristics>
                                        <countryCA_SensorCharacteristics>country of
                                        the physical
                                        address</countryCA_SensorCharacteristics>

                                        <electronicMailAddressCA_SensorCharacteristics
                                        >telephone number of a facsimile machine for
                                        the responsible organization or
                                        individual</electronicMailAddressCA_SensorChar
                                        acteristics>
                                    </CI_AddressCA_SensorCharacteristics>
                                </addressCA_SensorCharacteristics>
                                <onlineResourceCA_SensorCharacteristics>
                                    <CI_OnlineResourceCA_SensorCharacteristics>
                                        <linkageCA_SensorCharacteristics>location
```

```
                                    (address) for on-line access using a Uniform
                                    Resource Locator address or similar
                                    addressing
                                    scheme</linkageCA_SensorCharacteristics>
                                    <protocolCA_SensorCharacteristics>connection
                                    protocol to be
                                    used</protocolCA_SensorCharacteristics>

                                    <applicationProfileCA_SensorCharacteristics>na
                                    me of an application profile that can be
                                    used with the online
                                    resource</applicationProfileCA_SensorCharacter
                                    istics>

                                    <nameCI_OnlineResourceCA_SensorCharacteristics
                                    >name of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharac
                                    teristics>

                                    <descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics>detailed text description of what
                                    the online resource
                                    is/does</descriptionCI_OnlineResourceCA_Sensor
                                    Characteristics>

                                    <functionCA_SensorCharacteristics>download</fu
                                    nctionCA_SensorCharacteristics>
                                </CI_OnlineResourceCA_SensorCharacteristics>
                            </onlineResourceCA_SensorCharacteristics>
                            <hoursOfServiceCA_SensorCharacteristics>time period
                            (including time zone) when individuals can contact
                            the organization or
                            individual</hoursOfServiceCA_SensorCharacteristics>

                            <contactInstructionsCA_SensorCharacteristics>supplemen
                            tal instructions on how or when to contact the
                            individual or
                            organization</contactInstructionsCA_SensorCharacterist
                            ics>
                        </CI_ContactCA_SensorCharacteristics>
                    </contactInfoCA_SensorCharacteristics>

                    <roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorC
                    haracteristics>
                </CI_ResponsiblePartyCA_SensorCharacteristics>
            </citedResponsiblePartyCA_SensorCharacteristics>

            <presentationFormCA_SensorCharacteristics>documentDigital</presentatio
            nFormCA_SensorCharacteristics>
            <seriesCA_SensorCharacteristics>
                <CI_SeriesCA_SensorCharacteristics>
                    <nameCI_SeriesCA_SensorCharacteristics>name of the series,
                    or aggregate dataset, of which the dataset is a
                    part</nameCI_SeriesCA_SensorCharacteristics>
                    <issueIdentificationCA_SensorCharacteristics>information
                    identifying the issue of the
                    series</issueIdentificationCA_SensorCharacteristics>
                    <pageCA_SensorCharacteristics>details on which pages of the
                    publication the article was
                    published</pageCA_SensorCharacteristics>
                </CI_SeriesCA_SensorCharacteristics>
            </seriesCA_SensorCharacteristics>
            <otherCitationDetailsCA_SensorCharacteristics>other information
            required to complete the citation that is not recorded
            elsewhere</otherCitationDetailsCA_SensorCharacteristics>
            <collectiveTitleCA_SensorCharacteristics>common title with holdings
            note</collectiveTitleCA_SensorCharacteristics>
```

```
                <ISBNCA_SensorCharacteristics>international Standard Book
                Number</ISBNCA_SensorCharacteristics>
                <ISSNCA_SensorCharacteristics>international Standard Serial
                Number</ISSNCA_SensorCharacteristics>
            </CI_CitationCA_SensorCharacteristics>
        </citationCA_SensorCharacteristics>
        <abstractCA_SensorCharacteristics>brief narrative summary of the content of
        the resource(s)</abstractCA_SensorCharacteristics>
        <purposeCA_SensorCharacteristics>summary of the intentions with which the
        resource(s) was developed</purposeCA_SensorCharacteristics>
        <creditCA_SensorCharacteristics>recognition of those who contributed to the
        resource(s)</creditCA_SensorCharacteristics>
        <statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>
        <pointOfContactCA_SensorCharacteristics>
            <CI_ResponsiblePartyCA_SensorCharacteristics1>
                <individualNameCA_SensorCharacteristics1>name of the responsible
                person- surname,given name, title separated by a
                delimiter</individualNameCA_SensorCharacteristics1>
                <organisationNameCA_SensorCharacteristics1>name of the responsible
                organization</organisationNameCA_SensorCharacteristics1>
                <positionNameCA_SensorCharacteristics1>role or position of the
                responsible person</positionNameCA_SensorCharacteristics1>
                <contactInfoCA_SensorCharacteristics1>
                    <CI_ContactCA_SensorCharacteristics1>
                        <phoneCA_SensorCharacteristics1>
                            <CI_TelephoneCA_SensorCharacteristics1>
                                <voiceCA_SensorCharacteristics1>telephone number by
                                which individuals can speak to the responsible
                                organization or
                                individual</voiceCA_SensorCharacteristics1>
                                <facsimileCA_SensorCharacteristics1>telephone number
                                of a facsimile machine for the responsible
                                organization or
                                individual</facsimileCA_SensorCharacteristics1>
                            </CI_TelephoneCA_SensorCharacteristics1>
                        </phoneCA_SensorCharacteristics1>
                        <addressCA_SensorCharacteristics1>
                            <CI_AddressCA_SensorCharacteristics1>
                                <deliveryPointCA_SensorCharacteristics1>address line
                                for the
                                location</deliveryPointCA_SensorCharacteristics1>
                                <cityCA_SensorCharacteristics1>city of the
                                location</cityCA_SensorCharacteristics1>
                                <administrativeAreaCA_SensorCharacteristics1>state,
                                province of the
                                location</administrativeAreaCA_SensorCharacteristics1>
                                <postalCodeCA_SensorCharacteristics1>ZIP or other
                                postal code</postalCodeCA_SensorCharacteristics1>
                                <countryCA_SensorCharacteristics1>country of the
                                physical address</countryCA_SensorCharacteristics1>

                                <electronicMailAddressCA_SensorCharacteristics1>teleph
                                one number of a facsimile machine for the
                                responsible organization or
                                individual</electronicMailAddressCA_SensorCharacterist
                                ics1>
                            </CI_AddressCA_SensorCharacteristics1>
                        </addressCA_SensorCharacteristics1>
                        <onlineResourceCA_SensorCharacteristics1>
                            <CI_OnlineResourceCA_SensorCharacteristics1>
                                <linkageCA_SensorCharacteristics1>location (address)
                                for on-line access using a Uniform Resource Locator
                                address or similar addressing
                                scheme</linkageCA_SensorCharacteristics1>
                                <protocolCA_SensorCharacteristics1>connection
                                protocol to be
                                used</protocolCA_SensorCharacteristics1>
```

```
                                    <applicationProfileCA_SensorCharacteristics1>name of
                                    an application profile that can be used with the
                                    online
                                    resource</applicationProfileCA_SensorCharacteristics1>
                                    <nameCI_OnlineResourceCA_SensorCharacteristics1>name
                                    of the online
                                    resource</nameCI_OnlineResourceCA_SensorCharacteristic
                                    s1>

                                    <descriptionCI_OnlineResourceCA_SensorCharacteristics1
                                    >detailed text description of what the online
                                    resource
                                    is/does</descriptionCI_OnlineResourceCA_SensorCharacte
                                    ristics1>

                                    <functionCA_SensorCharacteristics1>download</functionC
                                    A_SensorCharacteristics1>
                                </CI_OnlineResourceCA_SensorCharacteristics1>
                            </onlineResourceCA_SensorCharacteristics1>
                            <hoursOfServiceCA_SensorCharacteristics1>time period
                            (including time zone) when individuals can contact the
                            organization or
                            individual</hoursOfServiceCA_SensorCharacteristics1>
                            <contactInstructionsCA_SensorCharacteristics1>supplemental
                            instructions on how or when to contact the individual or
                            organization</contactInstructionsCA_SensorCharacteristics1>
                        </CI_ContactCA_SensorCharacteristics1>
                    </contactInfoCA_SensorCharacteristics1>

                    <roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacte
                    ristics1>
                </CI_ResponsiblePartyCA_SensorCharacteristics1>
            </pointOfContactCA_SensorCharacteristics>
        </MD_IdentificationCA_SensorCharacteristics>
    </sensorIdentification>
    <cameraHead>camera or sensor head for which the information is valid</cameraHead>
    <channel>channel for which the information is valid</channel>
    <linearity>
        <CA_Linearity>
            <channelIdentification>alpha-numerical identification for the
            channel</channelIdentification>
            <receivedIntensity>0.0</receivedIntensity>
            <recordedIntensity>0.0</recordedIntensity>
        </CA_Linearity>
    </linearity>
    <absoluteSpectralError>0</absoluteSpectralError>
    <relativeSpectralError>0.0</relativeSpectralError>
    <dynamicRange>
        <CA_DynamicRange>
            <minimumGreyValue>0.0</minimumGreyValue>
            <maximumGreyValue>0.0</maximumGreyValue>
        </CA_DynamicRange>
    </dynamicRange>
    <spectralSensitivity>
        <CA_SpectralSensitivity>
            <minimumWavelength uom="#m">0.0</minimumWavelength>
            <maximumWavelength uom="#m">0.0</maximumWavelength>
            <sensitivityFunction>function that relates the received radiation to the
            sensor's response</sensitivityFunction>
        </CA_SpectralSensitivity>
    </spectralSensitivity>
    <signalToNoiseRatio>
        <CA_RadiometricDynamicsSignalToNoiseRatio>
            <bitSignalToNoiseRatio>1</bitSignalToNoiseRatio>
        </CA_RadiometricDynamicsSignalToNoiseRatio>
    </signalToNoiseRatio>
    <illuminationLevel>0.0</illuminationLevel>
```

```
        <modulationTransferFunction>0.0</modulationTransferFunction>
        <modulationTransferFunctionAcross>0.0</modulationTransferFunctionAcross>
        <modulationTransferFunctionAlong>0.0</modulationTransferFunctionAlong>
        <positionInImage>1.0</positionInImage>
        <polarization>definition of the polarization characteristics of the
        sensor</polarization>
        <radiomatricDynamics>
            <CA_RadiometricDynamicsRadiomatricDynamics>
                <bitRadiomatricDynamics>1</bitRadiomatricDynamics>
            </CA_RadiometricDynamicsRadiomatricDynamics>
        </radiomatricDynamics>
        <antiBlooming>yes</antiBlooming>
    </CA_SensorQualityEvaluation>
    <CA_SensorSystem>
        <calibrationType>laboratory</calibrationType>
        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>
        <geometryCalibrationType>more detailed explanation of the the calibration
        type</geometryCalibrationType>
        <synchronizationCA_SensorSystem>0-0-0 00:00:00</synchronizationCA_SensorSystem>
        <synchronizationErrorCA_SensorSystem>0-0-0
        00:00:00</synchronizationErrorCA_SensorSystem>
        <referenceTemperatureCA_SensorSystem>
            <CA_TemperatureCA_SensorSystem>
                <temperatureCA_SensorSystem>0.0</temperatureCA_SensorSystem>
            </CA_TemperatureCA_SensorSystem>
        </referenceTemperatureCA_SensorSystem>
        <versionFirmwareCA_SensorSystem>note about the firmware
        version</versionFirmwareCA_SensorSystem>
        <versionHardwareCA_SensorSystem>note about the hardware
        version</versionHardwareCA_SensorSystem>
        <relativePosition>0.0</relativePosition>
        <relativeAttitude>
            <SD_AttitudeCA_SensorSystem>
                <angleAttitudeCA_SensorSystem>
                    <SD_AngleAttitudeCA_SensorSystem>
                        <rotatedAxesCA_SensorSystem>yes</rotatedAxesCA_SensorSystem>
                        <rotationAngleXCA_SensorSystem
                        uom="#m">0.0</rotationAngleXCA_SensorSystem>
                        <rotationAngleYCA_SensorSystem
                        uom="#m">0.0</rotationAngleYCA_SensorSystem>
                        <rotationAngleZCA_SensorSystem
                        uom="#m">0.0</rotationAngleZCA_SensorSystem>
                        <rotationSequenceCA_SensorSystem>XYZ</rotationSequenceCA_SensorSystem>
                    </SD_AngleAttitudeCA_SensorSystem>
                </angleAttitudeCA_SensorSystem>
                <matrixAttitudeCA_SensorSystem>
                    <SD_MatrixAttitudeCA_SensorSystem>
                        <matrixElements1CA_SensorSystem>0.0</matrixElements1CA_SensorSystem>
                        <matrixElements2CA_SensorSystem>0.0</matrixElements2CA_SensorSystem>
                        <matrixElements3CA_SensorSystem>0.0</matrixElements3CA_SensorSystem>
                        <matrixElements4CA_SensorSystem>0.0</matrixElements4CA_SensorSystem>
                        <matrixElements5CA_SensorSystem>0.0</matrixElements5CA_SensorSystem>
                        <matrixElements6CA_SensorSystem>0.0</matrixElements6CA_SensorSystem>
                        <matrixElements7CA_SensorSystem>0.0</matrixElements7CA_SensorSystem>
                        <matrixElements8CA_SensorSystem>0.0</matrixElements8CA_SensorSystem>
                        <matrixElements9CA_SensorSystem>0.0</matrixElements9CA_SensorSystem>
                    </SD_MatrixAttitudeCA_SensorSystem>
                </matrixAttitudeCA_SensorSystem>
            </SD_AttitudeCA_SensorSystem>
        </relativeAttitude>
        <stitchingResiduals uom="#m">0.0</stitchingResiduals>
        <operationalTemperature>
            <CA_TemperatureRangeCA_SensorSystem>
                <minimumTemperatureCA_SensorSystem1>
                    <CA_TemperatureCA_SensorSystem1>
                        <temperatureCA_SensorSystem1>0.0</temperatureCA_SensorSystem1>
                    </CA_TemperatureCA_SensorSystem1>
```

```
            </minimumTemperatureCA_SensorSystem1>
            <maximumTemperatureCA_SensorSystem2>
                <CA_TemperatureCA_SensorSystem2>
                    <temperatureCA_SensorSystem2>0.0</temperatureCA_SensorSystem2>
                </CA_TemperatureCA_SensorSystem2>
            </maximumTemperatureCA_SensorSystem2>
        </CA_TemperatureRangeCA_SensorSystem>
    </operationalTemperature>
</CA_SensorSystem>
<CA_Siemensstar>
    <calibrationType>laboratory</calibrationType>
    <sizeCA_Siemensstar uom="#m">0.0</sizeCA_Siemensstar>
    <descriptionCA_Siemensstar>free text description of the
    target</descriptionCA_Siemensstar>
    <typeCA_Siemensstar>airforcePattern</typeCA_Siemensstar>
    <materialCA_Siemensstar>awning</materialCA_Siemensstar>
    <paintTypeCA_Siemensstar>characteristics of the paint</paintTypeCA_Siemensstar>
    <reflectancePropertiesCA_Siemensstar>peculiarity of the
    reflectance</reflectancePropertiesCA_Siemensstar>
    <diameter uom="#m">0.0</diameter>
    <sector uom="#m">0.0</sector>
    <numberOfBarsInSector>1</numberOfBarsInSector>
</CA_Siemensstar>
<CA_SMACParameters>
    <k>0.0</k>
    <p1>0.0</p1>
    <p2>0.0</p2>
</CA_SMACParameters>
<CA_SpectralSensitivity>
    <minimumWavelength uom="#m">0.0</minimumWavelength>
    <maximumWavelength uom="#m">0.0</maximumWavelength>
    <sensitivityFunction>function that relates the received radiation to the sensor's
    response</sensitivityFunction>
</CA_SpectralSensitivity>
<CA_Spectrum>
    <numberBands>0</numberBands>
    <wavelengthCA_Spectrum uom="#m">0.0</wavelengthCA_Spectrum>
    <response>0.0</response>
</CA_Spectrum>
<CA_TangentialDistortion>
    <t1>0.0</t1>
    <t2>0.0</t2>
</CA_TangentialDistortion>
<CA_Target>
    <equipment>description of additional equipment</equipment>
    <targetInclination uom="#m">0.0</targetInclination>
    <targetAzimuth uom="#m">0.0</targetAzimuth>
    <targetAltitude uom="#m">0.0</targetAltitude>
    <skyViewFactor>0.0</skyViewFactor>
    <viewshed>area that is visible from a fixed vantage point</viewshed>
    <targetEnvironment>homogeneous</targetEnvironment>
    <targetAccessibility>accessibility of the target primarily regarding road condition
    and eventual seasonal changes</targetAccessibility>
    <targetStability>description of the mechanical stability of the
    target</targetStability>
    <transmittanceSunToTarget>0.0</transmittanceSunToTarget>
    <transmittanceTargetToSatellite>0.0</transmittanceTargetToSatellite>
    <sunRadiationAtTopOfAtmosphere>0.0</sunRadiationAtTopOfAtmosphere>
    <radianceAtSatellite>0.0</radianceAtSatellite>
</CA_Target>
<CA_Temperature>
    <temperature>0.0</temperature>
</CA_Temperature>
<CA_TemperatureRange>
    <minimumTemperature>
        <CA_TemperatureMinimumTemperature>
            <temperatureMinimumTemperature>0.0</temperatureMinimumTemperature>
```

```
            </CA_TemperatureMinimumTemperature>
        </minimumTemperature>
        <maximumTemperature>
            <CA_TemperatureMaximumTemperature>
                <temperatureMaximumTemperature>0.0</temperatureMaximumTemperature>
            </CA_TemperatureMaximumTemperature>
        </maximumTemperature>
    </CA_TemperatureRange>
    <CA_TestRange>
        <calibrationType>laboratory</calibrationType>
        <controlPointCA_TestRange>0.0</controlPointCA_TestRange>
        <checkPoint>0.0</checkPoint>
        <numberControlPoints>0</numberControlPoints>
        <numberCheckPoints>0</numberCheckPoints>
        <groundSamplingDistance uom="#m">0.0</groundSamplingDistance>
        <minimumElevationCA_TestRange uom="#m">0.0</minimumElevationCA_TestRange>
        <maximumElevationCA_TestRange uom="#m">0.0</maximumElevationCA_TestRange>
        <averageElevationCA_TestRange uom="#m">0.0</averageElevationCA_TestRange>
        <positionalError>
            <CA_PositionalErrorCA_TestRange>
                <errorXCA_TestRange uom="#m">0.0</errorXCA_TestRange>
                <errorYCA_TestRange uom="#m">0.0</errorYCA_TestRange>
                <errorZCA_TestRange uom="#m">0.0</errorZCA_TestRange>
                <errorXYCA_TestRange uom="#m">0.0</errorXYCA_TestRange>
                <errorXYZCA_TestRange uom="#m">0.0</errorXYZCA_TestRange>
                <pointTypeCA_TestRange>controlPoint</pointTypeCA_TestRange>
                <errorTypeCA_TestRange>standardDeviation</errorTypeCA_TestRange>
                <quantityTypeCA_TestRange>minimum</quantityTypeCA_TestRange>
            </CA_PositionalErrorCA_TestRange>
        </positionalError>
        <lengthOfTestrange uom="#m">0.0</lengthOfTestrange>
        <widthOfTestrange uom="#m">0.0</widthOfTestrange>
        <elevationChangeOfTestrange uom="#m">0.0</elevationChangeOfTestrange>
    </CA_TestRange>
    <MI_Instrument>
        <citationMI_Instrument>
            <CI_CitationMI_Instrument>
                <titleMI_Instrument>name by which the cited resource is
                known</titleMI_Instrument>
                <alternateTitleMI_Instrument>short name or other language name by which the
                cited information is known</alternateTitleMI_Instrument>
                <dateMI_Instrument>
                    <CI_DateMI_Instrument>
                        <dateCI_DateMI_Instrument>1-09-2015</dateCI_DateMI_Instrument>
                        <dateTypeMI_Instrument>creation</dateTypeMI_Instrument>
                    </CI_DateMI_Instrument>
                </dateMI_Instrument>
                <editionMI_Instrument>version of the cited resource</editionMI_Instrument>
                <editionDateMI_Instrument>
                    <dateEditionDateMI_Instrument>1-09-2015</dateEditionDateMI_Instrument>
                </editionDateMI_Instrument>
                <identifierMI_Instrument>
                    <MD_IdentifierMI_Instrument>
                        <authorityMI_Instrument>person or party responsible for maintenance
                        of the namespace</authorityMI_Instrument>
                        <codeMI_Instrument>alphanumeric value identifying an instance in the
                        namespace</codeMI_Instrument>
                    </MD_IdentifierMI_Instrument>
                </identifierMI_Instrument>
                <citedResponsiblePartyMI_Instrument>
                    <CI_ResponsiblePartyMI_Instrument>
                        <individualNameMI_Instrument>name of the responsible person-
                        surname,given name, title separated by a
                        delimiter</individualNameMI_Instrument>
                        <organisationNameMI_Instrument>name of the responsible
                        organization</organisationNameMI_Instrument>
                        <positionNameMI_Instrument>role or position of the responsible
```

```
                person</positionNameMI_Instrument>
                <contactInfoMI_Instrument>
                    <CI_ContactMI_Instrument>
                        <phoneMI_Instrument>
                            <CI_TelephoneMI_Instrument>
                                <voiceMI_Instrument>telephone number by which
                                individuals can speak to the responsible
                                organization or individual</voiceMI_Instrument>
                                <facsimileMI_Instrument>telephone number of a
                                facsimile machine for the responsible organization
                                or individual</facsimileMI_Instrument>
                            </CI_TelephoneMI_Instrument>
                        </phoneMI_Instrument>
                        <addressMI_Instrument>
                            <CI_AddressMI_Instrument>
                                <deliveryPointMI_Instrument>address line for the
                                location</deliveryPointMI_Instrument>
                                <cityMI_Instrument>city of the
                                location</cityMI_Instrument>
                                <administrativeAreaMI_Instrument>state, province of
                                the location</administrativeAreaMI_Instrument>
                                <postalCodeMI_Instrument>ZIP or other postal
                                code</postalCodeMI_Instrument>
                                <countryMI_Instrument>country of the physical
                                address</countryMI_Instrument>
                                <electronicMailAddressMI_Instrument>telephone number
                                of a facsimile machine for the responsible
                                organization or
                                individual</electronicMailAddressMI_Instrument>
                            </CI_AddressMI_Instrument>
                        </addressMI_Instrument>
                        <onlineResourceMI_Instrument>
                            <CI_OnlineResourceMI_Instrument>
                                <linkageMI_Instrument>location (address) for on-line
                                access using a Uniform Resource Locator address or
                                similar addressing scheme</linkageMI_Instrument>
                                <protocolMI_Instrument>connection protocol to be
                                used</protocolMI_Instrument>
                                <applicationProfileMI_Instrument>name of an
                                application profile that can be used with the online
                                resource</applicationProfileMI_Instrument>
                                <nameCI_OnlineResourceMI_Instrument>name of the
                                online resource</nameCI_OnlineResourceMI_Instrument>
                                <descriptionCI_OnlineResourceMI_Instrument>detailed
                                text description of what the online resource
                                is/does</descriptionCI_OnlineResourceMI_Instrument>

                                <functionMI_Instrument>download</functionMI_Instrument
                                >
                            </CI_OnlineResourceMI_Instrument>
                        </onlineResourceMI_Instrument>
                        <hoursOfServiceMI_Instrument>time period (including time
                        zone) when individuals can contact the organization or
                        individual</hoursOfServiceMI_Instrument>
                        <contactInstructionsMI_Instrument>supplemental instructions
                        on how or when to contact the individual or
                        organization</contactInstructionsMI_Instrument>
                    </CI_ContactMI_Instrument>
                </contactInfoMI_Instrument>
                <roleMI_Instrument>resourceProvider</roleMI_Instrument>
            </CI_ResponsiblePartyMI_Instrument>
        </citedResponsiblePartyMI_Instrument>
        <presentationFormMI_Instrument>documentDigital</presentationFormMI_Instrument>
        <seriesMI_Instrument>
            <CI_SeriesMI_Instrument>
                <nameCI_SeriesMI_Instrument>name of the series, or aggregate
                dataset, of which the dataset is a part</nameCI_SeriesMI_Instrument>
```

```
                    <issueIdentificationMI_Instrument>information identifying the issue
                    of the series</issueIdentificationMI_Instrument>
                    <pageMI_Instrument>details on which pages of the publication the
                    article was published</pageMI_Instrument>
                </CI_SeriesMI_Instrument>
            </seriesMI_Instrument>
            <otherCitationDetailsMI_Instrument>other information required to complete
            the citation that is not recorded
            elsewhere</otherCitationDetailsMI_Instrument>
            <collectiveTitleMI_Instrument>common title with holdings
            note</collectiveTitleMI_Instrument>
            <ISBNMI_Instrument>international Standard Book Number</ISBNMI_Instrument>
            <ISSNMI_Instrument>international Standard Serial Number</ISSNMI_Instrument>
        </CI_CitationMI_Instrument>
    </citationMI_Instrument>
    <identifierMI_Instrument1>
        <MD_IdentifierMI_Instrument1>
            <authorityMI_Instrument1>person or party responsible for maintenance of the
            namespace</authorityMI_Instrument1>
            <codeMI_Instrument1>alphanumeric value identifying an instance in the
            namespace</codeMI_Instrument1>
        </MD_IdentifierMI_Instrument1>
    </identifierMI_Instrument1>
    <typeMI_Instrument>name of the type of instrument</typeMI_Instrument>
    <descriptionMI_Instrument>textual description of the
    instrument</descriptionMI_Instrument>
</MI_Instrument>
<SD_AngleAttitudeSD_AngleAttitude>
    <rotatedAxesSD_AngleAttitude>yes</rotatedAxesSD_AngleAttitude>
    <rotationAngleXSD_AngleAttitude uom="#m">0.0</rotationAngleXSD_AngleAttitude>
    <rotationAngleYSD_AngleAttitude uom="#m">0.0</rotationAngleYSD_AngleAttitude>
    <rotationAngleZSD_AngleAttitude uom="#m">0.0</rotationAngleZSD_AngleAttitude>
    <rotationSequenceSD_AngleAttitude>XYZ</rotationSequenceSD_AngleAttitude>
</SD_AngleAttitudeSD_AngleAttitude>
<SD_ArrayDimension>
    <nameSD_ArrayDimension>name of a detector array</nameSD_ArrayDimension>
    <sizeSD_ArrayDimension>0</sizeSD_ArrayDimension>
</SD_ArrayDimension>
<SD_Calibration>
    <calibrationAgency>
        <CI_ResponsiblePartySD_Calibration>
            <individualNameSD_Calibration>name of the responsible person- surname,given
            name, title separated by a delimiter</individualNameSD_Calibration>
            <organisationNameSD_Calibration>name of the responsible
            organization</organisationNameSD_Calibration>
            <positionNameSD_Calibration>role or position of the responsible
            person</positionNameSD_Calibration>
            <contactInfoSD_Calibration>
                <CI_ContactSD_Calibration>
                    <phoneSD_Calibration>
                        <CI_TelephoneSD_Calibration>
                            <voiceSD_Calibration>telephone number by which individuals
                            can speak to the responsible organization or
                            individual</voiceSD_Calibration>
                            <facsimileSD_Calibration>telephone number of a facsimile
                            machine for the responsible organization or
                            individual</facsimileSD_Calibration>
                        </CI_TelephoneSD_Calibration>
                    </phoneSD_Calibration>
                    <addressSD_Calibration>
                        <CI_AddressSD_Calibration>
                            <deliveryPointSD_Calibration>address line for the
                            location</deliveryPointSD_Calibration>
                            <citySD_Calibration>city of the location</citySD_Calibration>
                            <administrativeAreaSD_Calibration>state, province of the
                            location</administrativeAreaSD_Calibration>
                            <postalCodeSD_Calibration>ZIP or other postal
```

```
                                code</postalCodeSD_Calibration>
                                <countrySD_Calibration>country of the physical
                                address</countrySD_Calibration>
                                <electronicMailAddressSD_Calibration>telephone number of a
                                facsimile machine for the responsible organization or
                                individual</electronicMailAddressSD_Calibration>
                            </CI_AddressSD_Calibration>
                        </addressSD_Calibration>
                        <onlineResourceSD_Calibration>
                            <CI_OnlineResourceSD_Calibration>
                                <linkageSD_Calibration>location (address) for on-line access
                                using a Uniform Resource Locator address or similar
                                addressing scheme</linkageSD_Calibration>
                                <protocolSD_Calibration>connection protocol to be
                                used</protocolSD_Calibration>
                                <applicationProfileSD_Calibration>name of an application
                                profile that can be used with the online
                                resource</applicationProfileSD_Calibration>
                                <nameCI_OnlineResourceSD_Calibration>name of the online
                                resource</nameCI_OnlineResourceSD_Calibration>
                                <descriptionCI_OnlineResourceSD_Calibration>detailed text
                                description of what the online resource
                                is/does</descriptionCI_OnlineResourceSD_Calibration>
                                <functionSD_Calibration>download</functionSD_Calibration>
                            </CI_OnlineResourceSD_Calibration>
                        </onlineResourceSD_Calibration>
                        <hoursOfServiceSD_Calibration>time period (including time zone) when
                        individuals can contact the organization or
                        individual</hoursOfServiceSD_Calibration>
                        <contactInstructionsSD_Calibration>supplemental instructions on how
                        or when to contact the individual or
                        organization</contactInstructionsSD_Calibration>
                    </CI_ContactSD_Calibration>
                </contactInfoSD_Calibration>
                <roleSD_Calibration>resourceProvider</roleSD_Calibration>
            </CI_ResponsiblePartySD_Calibration>
        </calibrationAgency>
        <calibrationDate>1-09-2015</calibrationDate>
    </SD_Calibration>
    <SD_DetectorArray>
        <numberOfDimensions>0</numberOfDimensions>
        <arrayOrigin>0.0</arrayOrigin>
        <arrayDimensions1>
            <SD_ArrayDimension1>
                <nameSD_ArrayDimension1>name of a detector array</nameSD_ArrayDimension1>
                <sizeSD_ArrayDimension1>0</sizeSD_ArrayDimension1>
            </SD_ArrayDimension1>
        </arrayDimensions1>
        <arrayDimensions2>
            <SD_ArrayDimension2>
                <nameSD_ArrayDimension2>name of a detector array</nameSD_ArrayDimension2>
                <sizeSD_ArrayDimension2>0</sizeSD_ArrayDimension2>
            </SD_ArrayDimension2>
        </arrayDimensions2>
        <offsetVectors1>0.0</offsetVectors1>
        <offsetVectors2>0.0</offsetVectors2>
        <detectorSize1>0.0</detectorSize1>
        <detectorSize2>0.0</detectorSize2>
        <detectorShape>square</detectorShape>
        <distortion>
            <SD_Distortion>
                <princPointOfSymmetry>0.0</princPointOfSymmetry>
                <qualityOfPrincPointOfSymmetry>
                    <DQ_QuantitativeAttributeAccuracySD_Distortion>
                        <standaloneQualityReportDetailsSD_Distortion>description of the data
                        quality element</standaloneQualityReportDetailsSD_Distortion>
                    </DQ_QuantitativeAttributeAccuracySD_Distortion>
```

```
            </qualityOfPrincPointOfSymmetry>
        </SD_Distortion>
    </distortion>
</SD_DetectorArray>
<SD_Distortion>
    <princPointOfSymmetry>0.0</princPointOfSymmetry>
    <qualityOfPrincPointOfSymmetry>
        <DQ_QuantitativeAttributeAccuracySD_Distortion>
            <standaloneQualityReportDetailsSD_Distortion>description of the data quality
            element</standaloneQualityReportDetailsSD_Distortion>
        </DQ_QuantitativeAttributeAccuracySD_Distortion>
    </qualityOfPrincPointOfSymmetry>
</SD_Distortion>
<SD_DistortionPolynomial>
    <princPointOfSymmetry>0.0</princPointOfSymmetry>
    <qualityOfPrincPointOfSymmetry>
        <DQ_QuantitativeAttributeAccuracySD_Distortion>
            <standaloneQualityReportDetailsSD_Distortion>description of the data quality
            element</standaloneQualityReportDetailsSD_Distortion>
        </DQ_QuantitativeAttributeAccuracySD_Distortion>
    </qualityOfPrincPointOfSymmetry>
    <polynomialDecentering>
        <SD_PolynomialFunction1>
            <resultDimension1>column</resultDimension1>
        </SD_PolynomialFunction1>
    </polynomialDecentering>
    <polynomialRadial>
        <SD_PolynomialFunction2>
            <resultDimension2>column</resultDimension2>
        </SD_PolynomialFunction2>
    </polynomialRadial>
    <qualityOfPolynomialRadial>
        <DQ_PositionalAccuracySD_DistortionPolynomial>
            <standaloneQualityReportDetailsSD_DistortionPolynomial>description of the
            data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial>
        </DQ_PositionalAccuracySD_DistortionPolynomial>
    </qualityOfPolynomialRadial>
    <qualityOfPolynomialDecentering>
        <DQ_PositionalAccuracySD_DistortionPolynomial1>
            <standaloneQualityReportDetailsSD_DistortionPolynomial1>description of the
            data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial1>
        </DQ_PositionalAccuracySD_DistortionPolynomial1>
    </qualityOfPolynomialDecentering>
</SD_DistortionPolynomial>
<SD_DistortionTable>
    <princPointOfSymmetry>0.0</princPointOfSymmetry>
    <qualityOfPrincPointOfSymmetry>
        <DQ_QuantitativeAttributeAccuracySD_Distortion>
            <standaloneQualityReportDetailsSD_Distortion>description of the data quality
            element</standaloneQualityReportDetailsSD_Distortion>
        </DQ_QuantitativeAttributeAccuracySD_Distortion>
    </qualityOfPrincPointOfSymmetry>
    <rows>1</rows>
    <columns>1</columns>
    <xOffset>0</xOffset>
    <yOffset>0</yOffset>
    <xSpacing>0</xSpacing>
    <ySpacing>0</ySpacing>
    <distortionValues>0.0</distortionValues>
</SD_DistortionTable>
<SD_MatrixAttitude>
    <matrixElements1>0.0</matrixElements1>
    <matrixElements2>0.0</matrixElements2>
    <matrixElements3>0.0</matrixElements3>
    <matrixElements4>0.0</matrixElements4>
    <matrixElements5>0.0</matrixElements5>
    <matrixElements6>0.0</matrixElements6>
```

```
        <matrixElements7>0.0</matrixElements7>
        <matrixElements8>0.0</matrixElements8>
        <matrixElements9>0.0</matrixElements9>
    </SD_MatrixAttitude>
    <SD_OpticalSystem>
        <calibratedFocalLength uom="#m">0.0</calibratedFocalLength>
        <qualityOfCalibratedFocalLength>
            <DQ_QuantitativeAttributeAccuracySD_OpticalSystem>
                <standaloneQualityReportDetailsSD_OpticalSystem>description of n the data
                quality element</standaloneQualityReportDetailsSD_OpticalSystem>
            </DQ_QuantitativeAttributeAccuracySD_OpticalSystem>
        </qualityOfCalibratedFocalLength>
        <princPointAutocoll>0.0</princPointAutocoll>
        <covPrincPtAutocoll>
            <DQ_PositionalAccuracySD_OpticalSystem1>
                <standaloneQualityReportDetailsSD_OpticalSystem1>description of the data
                quality element</standaloneQualityReportDetailsSD_OpticalSystem1>
            </DQ_PositionalAccuracySD_OpticalSystem1>
        </covPrincPtAutocoll>
    </SD_OpticalSystem>
    <SD_Sensor>
        <citationSD_Calibration>
            <SD_Calibration>
                <calibrationAgency>
                    <CI_ResponsiblePartySD_Calibration>
                        <individualNameSD_Calibration>name of the responsible person-
                        surname,given name, title separated by a
                        delimiter</individualNameSD_Calibration>
                        <organisationNameSD_Calibration>name of the responsible
                        organization</organisationNameSD_Calibration>
                        <positionNameSD_Calibration>role or position of the responsible
                        person</positionNameSD_Calibration>
                        <contactInfoSD_Calibration>
                            <CI_ContactSD_Calibration>
                                <phoneSD_Calibration>
                                    <CI_TelephoneSD_Calibration>
                                        <voiceSD_Calibration>telephone number by which
                                        individuals can speak to the responsible
                                        organization or individual</voiceSD_Calibration>
                                        <facsimileSD_Calibration>telephone number of a
                                        facsimile machine for the responsible organization
                                        or individual</facsimileSD_Calibration>
                                    </CI_TelephoneSD_Calibration>
                                </phoneSD_Calibration>
                                <addressSD_Calibration>
                                    <CI_AddressSD_Calibration>
                                        <deliveryPointSD_Calibration>address line for the
                                        location</deliveryPointSD_Calibration>
                                        <citySD_Calibration>city of the
                                        location</citySD_Calibration>
                                        <administrativeAreaSD_Calibration>state, province of
                                        the location</administrativeAreaSD_Calibration>
                                        <postalCodeSD_Calibration>ZIP or other postal
                                        code</postalCodeSD_Calibration>
                                        <countrySD_Calibration>country of the physical
                                        address</countrySD_Calibration>
                                        <electronicMailAddressSD_Calibration>telephone
                                        number of a facsimile machine for the responsible
                                        organization or
                                        individual</electronicMailAddressSD_Calibration>
                                    </CI_AddressSD_Calibration>
                                </addressSD_Calibration>
                                <onlineResourceSD_Calibration>
                                    <CI_OnlineResourceSD_Calibration>
                                        <linkageSD_Calibration>location (address) for
                                        on-line access using a Uniform Resource Locator
                                        address or similar addressing
```

```
                                    scheme</linkageSD_Calibration>
                                    <protocolSD_Calibration>connection protocol to be
                                    used</protocolSD_Calibration>
                                    <applicationProfileSD_Calibration>name of an
                                    application profile that can be used with the online
                                    resource</applicationProfileSD_Calibration>
                                    <nameCI_OnlineResourceSD_Calibration>name of the
                                    online resource</nameCI_OnlineResourceSD_Calibration>
                                    <descriptionCI_OnlineResourceSD_Calibration>detailed
                                    text description of what the online resource
                                    is/does</descriptionCI_OnlineResourceSD_Calibration>

                                    <functionSD_Calibration>download</functionSD_Calibrati
                                    on>
                                </CI_OnlineResourceSD_Calibration>
                            </onlineResourceSD_Calibration>
                            <hoursOfServiceSD_Calibration>time period (including time
                            zone) when individuals can contact the organization or
                            individual</hoursOfServiceSD_Calibration>
                            <contactInstructionsSD_Calibration>supplemental instructions
                            on how or when to contact the individual or
                            organization</contactInstructionsSD_Calibration>
                        </CI_ContactSD_Calibration>
                    </contactInfoSD_Calibration>
                    <roleSD_Calibration>resourceProvider</roleSD_Calibration>
                </CI_ResponsiblePartySD_Calibration>
            </calibrationAgency>
            <calibrationDate>1-09-2015</calibrationDate>
        </SD_Calibration>
    </citationSD_Calibration>
    <mode>type of observation being made by sensor</mode>
    <operationalBand>
        <MI_Band>
            <bandBoundaryDefinition>3dB</bandBoundaryDefinition>
            <nominalSpatialResolution>0.0</nominalSpatialResolution>
            <transferFunctionType>linear</transferFunctionType>
            <transmittedPolarization>horizontal</transmittedPolarization>
            <detectedPolarization>horizontal</detectedPolarization>
        </MI_Band>
    </operationalBand>
</SD_Sensor>
</Norm>
```

Anhang B
Die XML-Datei mit den nichtgenormten Parametern (Others)

```
<?xml version="1.0" encoding="UTF-8"?>
<others>
<bibliography>description of the used books or other studies such as journal
articles</bibliography>
<calibrationDateCameraHead1>1-09-2015</calibrationDateCameraHead1>
<calibrationDateCameraHead2>1-09-2015</calibrationDateCameraHead2>
<calibrationDateCameraHead3>1-09-2015</calibrationDateCameraHead3>
<calibrationDateCameraHead4>1-09-2015</calibrationDateCameraHead4>
<calibrationDateCameraHeadReference>1-09-2015</calibrationDateCameraHeadReference>
<calibrationResult>information about the result of the calibration</calibrationResult>
<cameraHead1>name of camera head1</cameraHead1>
<cameraHead2>name of camera head2</cameraHead2>
<cameraHead3>name of camera head3</cameraHead3>
<cameraHead4>name of camera head4</cameraHead4>
<cameraHeadReference>name of camera head (reference)</cameraHeadReference>
<cameraName>name of camera which was calibrated</cameraName>
<ccdRevision>0</ccdRevision>
<columnCameraHead1>0</columnCameraHead1>
<columnCameraHead2>0</columnCameraHead2>
<columnCameraHead3>0</columnCameraHead3>
<columnCameraHead4>0</columnCameraHead4>
<columnPAN>0</columnPAN>
<compersationOfLightFallOff>0</compersationOfLightFallOff>
<coordinateReferenceSystem>a framework for locating geographical
entities</coordinateReferenceSystem>
<covPrincPtAutocollOthers>0.0</covPrincPtAutocollOthers>
<customerAddress>address line for the location</customerAddress>
<customerCity>city of the location</customerCity>
<customerCountry>country of the location</customerCountry>
<customerName>customer's name</customerName>
<dataNumberCameraHead1>0</dataNumberCameraHead1>
<dataNumberCameraHead2>0</dataNumberCameraHead2>
<dataNumberCameraHead3>0</dataNumberCameraHead3>
<dataNumberCameraHead4>0</dataNumberCameraHead4>
<dataNumberPAN>0</dataNumberPAN>
<dateDefectPixel>0</dateDefectPixel>
<dateOfAerialTriangulation>1-09-2015</dateOfAerialTriangulation>
<dateOfCertification>1-09-2015</dateOfCertification>
<dateOfReport>1-09-2015</dateOfReport>
<definitionOfColumnDefects>definition of column defects</definitionOfColumnDefects>
<degreesOfFreedom>0</degreesOfFreedom>
<descriptionOfBrightImage>description of bright image</descriptionOfBrightImage>
<descriptionOfDarkImage>description of dark image</descriptionOfDarkImage>
<descriptionOfLinearity>description of linearity</descriptionOfLinearity>
<descriptionOfPPSCorrectionColumn>description of PPS Correction
(column)</descriptionOfPPSCorrectionColumn>
<descriptionOfPPSCorrectionPixel>description of PPS Correction
(pixel)</descriptionOfPPSCorrectionPixel>
<descriptionOfSensitivity>description of sensitivity</descriptionOfSensitivity>
<descriptionOfSensorGeometricAccuracy>description of sensor geometric
accuracy</descriptionOfSensorGeometricAccuracy>
<descriptionOfSensorNoise>description of sensor noise</descriptionOfSensorNoise>
<deviationFromTheLinearityCameraHead>0</deviationFromTheLinearityCameraHead>
<deviationFromTheLinearityPAN>0</deviationFromTheLinearityPAN>
<exposureTimeCameraHead>0</exposureTimeCameraHead>
<exposureTimePAN>0</exposureTimePAN>
<figureLightFallOff>description of the figure Light fall off and correction
normalisation</figureLightFallOff>
<grayvalueCameraHeadIntermediate>0</grayvalueCameraHeadIntermediate>
<grayvalueCameraHeadRaw>0</grayvalueCameraHeadRaw>
<grossControlBlunders>0</grossControlBlunders>
<grossImageBlunders>0</grossImageBlunders>
<imageBlunders>0</imageBlunders>
<imageBrightnessAfterNormalizationCameraHead>0</imageBrightnessAfterNormalizationCameraHead>
```

```
<imageBrightnessBeforeNormalizationCameraHead>0</imageBrightnessBeforeNormalizationCameraHead>
<imageNoiseApertureCameraHead>0</imageNoiseApertureCameraHead>
<imageNoiseAperturePAN>0</imageNoiseAperturePAN>
<imagePointsUsed>0</imagePointsUsed>
<imageSizeX>0</imageSizeX>
<imageSizeY>0</imageSizeY>
<lightCameraHeadIntermediate>0</lightCameraHeadIntermediate>
<lightCameraHeadRaw>0</lightCameraHeadRaw>
<manufacturer>manufacturer of camera</manufacturer>
<manufacturersCity>manufacturer's city</manufacturersCity>
<manufacturersCountry>manufacturer's country</manufacturersCountry>
<maxDoubleColumnCameraHead>0</maxDoubleColumnCameraHead>
<maxDoubleColumnPAN>0</maxDoubleColumnPAN>
<maxGroundResidualX>0.0</maxGroundResidualX>
<maxGroundResidualY>0.0</maxGroundResidualY>
<maxGroundResidualZ>0.0</maxGroundResidualZ>
<maximumAllowedDefectPixelsPAN>0</maximumAllowedDefectPixelsPAN>
<maximumAllowedDefectPixelsCameraHead>0</maximumAllowedDefectPixelsCameraHead>
<maxRMSX>0.0</maxRMSX>
<maxRMSY>0.0</maxRMSY>
<maxRMSZ>0.0</maxRMSZ>
<maxSingleColumnCameraHead>0</maxSingleColumnCameraHead>
<maxSingleColumnPAN>0</maxSingleColumnPAN>
<meanStdDevObjectX>0.0</meanStdDevObjectX>
<meanStdDevObjectY>0.0</meanStdDevObjectY>
<meanStdDevObjectZ>0.0</meanStdDevObjectZ>
<meanStdDevPhotoAttitudeX>0.0</meanStdDevPhotoAttitudeX>
<meanStdDevPhotoAttitudeY>0.0</meanStdDevPhotoAttitudeY>
<meanStdDevPhotoAttitudeZ>0.0</meanStdDevPhotoAttitudeZ>
<meanStdDevPhotoPositionX>0.0</meanStdDevPhotoPositionX>
<meanStdDevPhotoPositionY>0.0</meanStdDevPhotoPositionY>
<meanStdDevPhotoPositionZ>0.0</meanStdDevPhotoPositionZ>
<modulationTransferFunctionCameraHead1>0.0</modulationTransferFunctionCameraHead1>
<modulationTransferFunctionCameraHead2>0.0</modulationTransferFunctionCameraHead2>
<modulationTransferFunctionCameraHead3>0.0</modulationTransferFunctionCameraHead3>
<modulationTransferFunctionCameraHead4>0.0</modulationTransferFunctionCameraHead4>
<modulationTransferFunctionPAN>0.0</modulationTransferFunctionPAN>
<noiseCameraAfterNormalizationCameraHead>0</noiseCameraAfterNormalizationCameraHead>
<noiseCameraBeforeNormalizationCameraHead>0</noiseCameraBeforeNormalizationCameraHead>
<numberOfColumns>0</numberOfColumns>
<numberOfDefectClustersCameraHead1>0</numberOfDefectClustersCameraHead1>
<numberOfDefectClustersCameraHead2>0</numberOfDefectClustersCameraHead2>
<numberOfDefectClustersCameraHead3>0</numberOfDefectClustersCameraHead3>
<numberOfDefectClustersCameraHead4>0</numberOfDefectClustersCameraHead4>
<numberOfDefectClustersPAN>0</numberOfDefectClustersPAN>
<numberOfDefectColumnsCameraHead1>0</numberOfDefectColumnsCameraHead1>
<numberOfDefectColumnsCameraHead2>0</numberOfDefectColumnsCameraHead2>
<numberOfDefectColumnsCameraHead3>0</numberOfDefectColumnsCameraHead3>
<numberOfDefectColumnsCameraHead4>0</numberOfDefectColumnsCameraHead4>
<numberOfDefectColumnsPAN>0</numberOfDefectColumnsPAN>
<numberOfDefectPixelsCameraHead1>0</numberOfDefectPixelsCameraHead1>
<numberOfDefectPixelsCameraHead2>0</numberOfDefectPixelsCameraHead2>
<numberOfDefectPixelsCameraHead3>0</numberOfDefectPixelsCameraHead3>
<numberOfDefectPixelsCameraHead4>0</numberOfDefectPixelsCameraHead4>
<numberOfDefectPixelsPAN>0</numberOfDefectPixelsPAN>
<numberOfIteration>0</numberOfIteration>
<numberOfPhotosAlongStripNS>0</numberOfPhotosAlongStripNS>
<numberOfPhotosAlongStripWE>0</numberOfPhotosAlongStripWE>
<numberOfRows>0</numberOfRows>
<personResponsibleForAerialTriangulation>person responsible for aerial
triangulation</personResponsibleForAerialTriangulation>
<personResponsibleForCalibration>person responsible for the
calibration</personResponsibleForCalibration>
<personResponsibleForCertification>person responsible for the
certification</personResponsibleForCertification>
<photosNotUsed>0</photosNotUsed>
<pixelsOfBrightImage>description of CCD Sensor (bright image)</pixelsOfBrightImage>
```

```
<pixelsOfDarkImage>description of CCD Sensor (dark image)</pixelsOfDarkImage>
<pixelSizeX>0</pixelSizeX>
<pixelSizeY>0</pixelSizeY>
<princPointAutocollX>0.0</princPointAutocollX>
<princPointAutocollY>0.0</princPointAutocollY>
<projectSettingsAngular>unit of angle</projectSettingsAngular>
<projectSettingsCurvature>yes</projectSettingsCurvature>
<projectSettingsLinear>unit of length</projectSettingsLinear>
<projectSettingsRefraction>yes</projectSettingsRefraction>
<qualityOfCalibratedFocalLengthOthers>0.0</qualityOfCalibratedFocalLengthOthers>
<radiusF2.8CameraHead1>0</radiusF2.8CameraHead1>
<radiusF2.8CameraHead2>0</radiusF2.8CameraHead2>
<radiusF2.8CameraHead3>0</radiusF2.8CameraHead3>
<radiusF2.8CameraHead4>0</radiusF2.8CameraHead4>
<radiusF4CameraHead1>0</radiusF4CameraHead1>
<radiusF4CameraHead2>0</radiusF4CameraHead2>
<radiusF4CameraHead3>0</radiusF4CameraHead3>
<radiusF4CameraHead4>0</radiusF4CameraHead4>
<radiusF5.6CameraHead1>0</radiusF5.6CameraHead1>
<radiusF5.6CameraHead2>0</radiusF5.6CameraHead2>
<radiusF5.6CameraHead3>0</radiusF5.6CameraHead3>
<radiusF5.6CameraHead4>0</radiusF5.6CameraHead4>
<radiusF5.6PAN>0</radiusF5.6PAN>
<radiusF8CameraHead1>0</radiusF8CameraHead1>
<radiusF8CameraHead2>0</radiusF8CameraHead2>
<radiusF8CameraHead3>0</radiusF8CameraHead3>
<radiusF8CameraHead4>0</radiusF8CameraHead4>
<radiusF8PAN>0</radiusF8PAN>
<radiusF11CameraHead1>0</radiusF11CameraHead1>
<radiusF11CameraHead2>0</radiusF11CameraHead2>
<radiusF11CameraHead3>0</radiusF11CameraHead3>
<radiusF11CameraHead4>0</radiusF11CameraHead4>
<radiusF11PAN>0</radiusF11PAN>
<radiusF16CameraHead1>0</radiusF16CameraHead1>
<radiusF16CameraHead2>0</radiusF16CameraHead2>
<radiusF16CameraHead3>0</radiusF16CameraHead3>
<radiusF16CameraHead4>0</radiusF16CameraHead4>
<radiusF16PAN>0</radiusF16PAN>
<radiusF22CameraHead1>0</radiusF22CameraHead1>
<radiusF22CameraHead2>0</radiusF22CameraHead2>
<radiusF22CameraHead3>0</radiusF22CameraHead3>
<radiusF22CameraHead4>0</radiusF22CameraHead4>
<radiusF22PAN>0</radiusF22PAN>
<radiusF32PAN>0</radiusF32PAN>
<recognition>recognition (bright and dark)</recognition>
<relativeGrayvalueF2.8CameraHead1>0.0</relativeGrayvalueF2.8CameraHead1>
<relativeGrayvalueF2.8CameraHead2>0.0</relativeGrayvalueF2.8CameraHead2>
<relativeGrayvalueF2.8CameraHead3>0.0</relativeGrayvalueF2.8CameraHead3>
<relativeGrayvalueF2.8CameraHead4>0.0</relativeGrayvalueF2.8CameraHead4>
<relativeGrayvalueF4CameraHead1>0.0</relativeGrayvalueF4CameraHead1>
<relativeGrayvalueF4CameraHead2>0.0</relativeGrayvalueF4CameraHead2>
<relativeGrayvalueF4CameraHead3>0.0</relativeGrayvalueF4CameraHead3>
<relativeGrayvalueF4CameraHead4>0.0</relativeGrayvalueF4CameraHead4>
<relativeGrayvalueF5.6CameraHead1>0.0</relativeGrayvalueF5.6CameraHead1>
<relativeGrayvalueF5.6CameraHead2>0.0</relativeGrayvalueF5.6CameraHead2>
<relativeGrayvalueF5.6CameraHead3>0.0</relativeGrayvalueF5.6CameraHead3>
<relativeGrayvalueF5.6CameraHead4>0.0</relativeGrayvalueF5.6CameraHead4>
<relativeGrayvalueF5.6PAN>0.0</relativeGrayvalueF5.6PAN>
<relativeGrayvalueF8CameraHead1>0.0</relativeGrayvalueF8CameraHead1>
<relativeGrayvalueF8CameraHead2>0.0</relativeGrayvalueF8CameraHead2>
<relativeGrayvalueF8CameraHead3>0.0</relativeGrayvalueF8CameraHead3>
<relativeGrayvalueF8CameraHead4>0.0</relativeGrayvalueF8CameraHead4>
<relativeGrayvalueF8PAN>0.0</relativeGrayvalueF8PAN>
<relativeGrayvalueF11CameraHead1>0.0</relativeGrayvalueF11CameraHead1>
<relativeGrayvalueF11CameraHead2>0.0</relativeGrayvalueF11CameraHead2>
<relativeGrayvalueF11CameraHead3>0.0</relativeGrayvalueF11CameraHead3>
<relativeGrayvalueF11CameraHead4>0.0</relativeGrayvalueF11CameraHead4>
```

```
<relativeGrayvalueF11PAN>0.0</relativeGrayvalueF11PAN>
<relativeGrayvalueF16CameraHead1>0.0</relativeGrayvalueF16CameraHead1>
<relativeGrayvalueF16CameraHead2>0.0</relativeGrayvalueF16CameraHead2>
<relativeGrayvalueF16CameraHead3>0.0</relativeGrayvalueF16CameraHead3>
<relativeGrayvalueF16CameraHead4>0.0</relativeGrayvalueF16CameraHead4>
<relativeGrayvalueF16PAN>0.0</relativeGrayvalueF16PAN>
<relativeGrayvalueF22CameraHead1>0.0</relativeGrayvalueF22CameraHead1>
<relativeGrayvalueF22CameraHead2>0.0</relativeGrayvalueF22CameraHead2>
<relativeGrayvalueF22CameraHead3>0.0</relativeGrayvalueF22CameraHead3>
<relativeGrayvalueF22CameraHead4>0.0</relativeGrayvalueF22CameraHead4>
<relativeGrayvalueF22PAN>0.0</relativeGrayvalueF22PAN>
<relativeGrayvalueF32PAN>0.0</relativeGrayvalueF32PAN>
<relativeSpectralResponseCameraHead1>0.0</relativeSpectralResponseCameraHead1>
<relativeSpectralResponseCameraHead2>0.0</relativeSpectralResponseCameraHead2>
<relativeSpectralResponseCameraHead3>0.0</relativeSpectralResponseCameraHead3>
<relativeSpectralResponseCameraHead4>0.0</relativeSpectralResponseCameraHead4>
<relativeSpectralResponsePAN>0.0</relativeSpectralResponsePAN>
<residualLimitsX>0.0</residualLimitsX>
<residualLimitsY>0.0</residualLimitsY>
<residualLimitsZ>0.0</residualLimitsZ>
<revisionOfCalibration>0</revisionOfCalibration>
<rmsCheckX>0.0</rmsCheckX>
<rmsCheckY>0.0</rmsCheckY>
<rmsCheckZ>0.0</rmsCheckZ>
<rmsControlX>0.0</rmsControlX>
<rmsControlY>0.0</rmsControlY>
<rmsControlZ>0.0</rmsControlZ>
<rmsImageX>0.0</rmsImageX>
<rmsImageY>0.0</rmsImageY>
<rmsLimitsX>0.0</rmsLimitsX>
<rmsLimitsY>0.0</rmsLimitsY>
<rmsLimitsZ>0.0</rmsLimitsZ>
<rmsPhotoAttitudeX>0.0</rmsPhotoAttitudeX>
<rmsPhotoAttitudeY>0.0</rmsPhotoAttitudeY>
<rmsPhotoAttitudeZ>0.0</rmsPhotoAttitudeZ>
<rmsPhotoPositionX>0.0</rmsPhotoPositionX>
<rmsPhotoPositionY>0.0</rmsPhotoPositionY>
<rmsPhotoPositionZ>0.0</rmsPhotoPositionZ>
<rowCameraHead1>0</rowCameraHead1>
<rowCameraHead2>0</rowCameraHead2>
<rowCameraHead3>0</rowCameraHead3>
<rowCameraHead4>0</rowCameraHead4>
<rowPAN>0</rowPAN>
<run-Spacing>0.0</run-Spacing>
<serialNumberCameraHead1>alphanumeric value identifying a camera
head1</serialNumberCameraHead1>
<serialNumberCameraHead2>alphanumeric value identifying a camera
head2</serialNumberCameraHead2>
<serialNumberCameraHead3>alphanumeric value identifying a camera
head3</serialNumberCameraHead3>
<serialNumberCameraHead4>alphanumeric value identifying a camera
head4</serialNumberCameraHead4>
<serialNumberReference>alphanumeric value identifying a camera head
(reference)</serialNumberReference>
<signalToNoiseRatioCalPAN>0</signalToNoiseRatioCalPAN>
<signalToNoiseRatioNoCalPAN>0</signalToNoiseRatioNoCalPAN>
<solutionStatus>description of solution status</solutionStatus>
<spectrometerMeasuredRadianceCalPAN>0.0</spectrometerMeasuredRadianceCalPAN>
<spectrometerMeasuredRadianceNoCalPAN>0.0</spectrometerMeasuredRadianceNoCalPAN>
<temperatureForMTFCameraHead1>0.0</temperatureForMTFCameraHead1>
<temperatureForMTFCameraHead2>0.0</temperatureForMTFCameraHead2>
<temperatureForMTFCameraHead3>0.0</temperatureForMTFCameraHead3>
<temperatureForMTFCameraHead4>0.0</temperatureForMTFCameraHead4>
<temperatureForMTFPAN>0.0</temperatureForMTFPAN>
<temperatureStabilityCameraHead>0</temperatureStabilityCameraHead>
<temperatureStabilityPAN>0</temperatureStabilityPAN>
<wavelengthCameraHead1>0</wavelengthCameraHead1>
```

```
<wavelengthCameraHead2>0</wavelengthCameraHead2>
<wavelengthCameraHead3>0</wavelengthCameraHead3>
<wavelengthCameraHead4>0</wavelengthCameraHead4>
<wavelengthPAN>0</wavelengthPAN>
</others>
```

Anhang C
XML-Datei mit den Datentypen von den Parametern (Types)

```
<?xml version="1.0" encoding="UTF-8"?>
<dataTypes>
<type>
<name>string</name>
<parameter>bibliography</parameter>
<parameter>calibrationResult</parameter>
<parameter>cameraHead1</parameter>
<parameter>cameraHead2</parameter>
<parameter>cameraHead3</parameter>
<parameter>cameraHead4</parameter>
<parameter>cameraHeadReference</parameter>
<parameter>cameraName</parameter>
<parameter>coordinateReferenceSystem</parameter>
<parameter>customerAddress</parameter>
<parameter>customerCity</parameter>
<parameter>customerCountry</parameter>
<parameter>customerName</parameter>
<parameter>definitionOfColumnDefects</parameter>
<parameter>descriptionOfBrightImage</parameter>
<parameter>descriptionOfDarkImage</parameter>
<parameter>descriptionOfLinearity</parameter>
<parameter>descriptionOfPPSCorrectionColumn</parameter>
<parameter>descriptionOfPPSCorrectionPixel</parameter>
<parameter>descriptionOfSensitivity</parameter>
<parameter>descriptionOfSensorGeometricAccuracy</parameter>
<parameter>descriptionOfSensorNoise</parameter>
<parameter>figureLightFallOff</parameter>
<parameter>imageSizeX</parameter>
<parameter>imageSizeY</parameter>
<parameter>manufacturer</parameter>
<parameter>manufacturersCity</parameter>
<parameter>manufacturersCountry</parameter>
<parameter>personResponsibleForAerialTriangulation</parameter>
<parameter>personResponsibleForCalibration</parameter>
<parameter>personResponsibleForCertification</parameter>
<parameter>pixelsOfBrightImage</parameter>
<parameter>pixelsOfDarkImage</parameter>
<parameter>projectSettingsAngular</parameter>
<parameter>projectSettingsLinear</parameter>
<parameter>recognition</parameter>
<parameter>serialNumberCameraHead1</parameter>
<parameter>serialNumberCameraHead2</parameter>
<parameter>serialNumberCameraHead3</parameter>
<parameter>serialNumberCameraHead4</parameter>
<parameter>serialNumberReference</parameter>
<parameter>solutionStatus</parameter>

<parameter>abstract</parameter>
<parameter>abstractCA_Detector</parameter>
<parameter>abstractCA_RadiometryInSensor</parameter>
<parameter>abstractCA_SensorCharacteristics</parameter>
<parameter>administrativeArea</parameter>
<parameter>administrativeAreaCA_Detector</parameter>
<parameter>administrativeAreaCA_Detector1</parameter>
<parameter>administrativeAreaCA_Radiation</parameter>
<parameter>administrativeAreaCA_RadiometryInSensor</parameter>
<parameter>administrativeAreaCA_RadiometryInSensor1</parameter>
<parameter>administrativeAreaCA_RadiometryPreCorrection</parameter>
<parameter>administrativeAreaCA_SensorCharacteristics</parameter>
<parameter>administrativeAreaCA_SensorCharacteristics1</parameter>
<parameter>administrativeAreaMI_Instrument</parameter>
<parameter>administrativeAreaSD_Calibration</parameter>
<parameter>alternateTitleCA_Detector</parameter>
<parameter>alternateTitleCA_Radiation</parameter>
```

<parameter>**alternateTitleCA_RadiometryInSensor**</parameter>
<parameter>**alternateTitleCA_RadiometryPreCorrection**</parameter>
<parameter>**alternateTitleCA_SensorCharacteristics**</parameter>
<parameter>**alternateTitleMI_Instrument**</parameter>
<parameter>**applicationProfile**</parameter>
<parameter>**applicationProfileCA_Detector**</parameter>
<parameter>**applicationProfileCA_Detector1**</parameter>
<parameter>**applicationProfileCA_Radiation**</parameter>
<parameter>**applicationProfileCA_RadiometryInSensor**</parameter>
<parameter>**applicationProfileCA_RadiometryInSensor1**</parameter>
<parameter>**applicationProfileCA_RadiometryPreCorrection**</parameter>
<parameter>**applicationProfileCA_SensorCharacteristics**</parameter>
<parameter>**applicationProfileCA_SensorCharacteristics1**</parameter>
<parameter>**applicationProfileMI_Instrument**</parameter>
<parameter>**applicationProfileSD_Calibration**</parameter>
<parameter>**authority**</parameter>
<parameter>**authorityCA_Detector**</parameter>
<parameter>**authorityCA_Documentation**</parameter>
<parameter>**authorityCA_Radiation**</parameter>
<parameter>**authorityCA_RadiometryInSensor**</parameter>
<parameter>**authorityCA_RadiometryPreCorrection**</parameter>
<parameter>**authorityCA_SensorCharacteristics**</parameter>
<parameter>**authorityMI_Instrument**</parameter>
<parameter>**authorityMI_Instrument1**</parameter>
<parameter>**bandBoundaryDefinition**</parameter>
<parameter>**code**</parameter>
<parameter>**codeCA_Detector**</parameter>
<parameter>**codeCA_Documentation**</parameter>
<parameter>**codeCA_Radiation**</parameter>
<parameter>**codeCA_RadiometryInSensor**</parameter>
<parameter>**codeCA_RadiometryPreCorrection**</parameter>
<parameter>**codeCA_SensorCharacteristics**</parameter>
<parameter>**codeMI_Instrument**</parameter>
<parameter>**codeMI_Instrument1**</parameter>
<parameter>**city**</parameter>
<parameter>**cityCA_Detector**</parameter>
<parameter>**cityCA_Detector1**</parameter>
<parameter>**cityCA_Radiation**</parameter>
<parameter>**cityCA_RadiometryInSensor**</parameter>
<parameter>**cityCA_RadiometryInSensor1**</parameter>
<parameter>**cityCA_RadiometryPreCorrection**</parameter>
<parameter>**cityCA_SensorCharacteristics**</parameter>
<parameter>**cityCA_SensorCharacteristics1**</parameter>
<parameter>**cityMI_Instrument**</parameter>
<parameter>**citySD_Calibration**</parameter>
<parameter>**collectiveTitle**</parameter>
<parameter>**collectiveTitleCA_Detector**</parameter>
<parameter>**collectiveTitleCA_Radiation**</parameter>
<parameter>**collectiveTitleCA_RadiometryInSensor**</parameter>
<parameter>**collectiveTitleCA_RadiometryPreCorrection**</parameter>
<parameter>**collectiveTitleCA_SensorCharacteristics**</parameter>
<parameter>**collectiveTitleMI_Instrument**</parameter>
<parameter>**contactInstructions**</parameter>
<parameter>**contactInstructionsCA_Detector**</parameter>
<parameter>**contactInstructionsCA_Detector1**</parameter>
<parameter>**contactInstructionsCA_Radiation**</parameter>
<parameter>**contactInstructionsCA_RadiometryInSensor**</parameter>
<parameter>**contactInstructionsCA_RadiometryInSensor1**</parameter>
<parameter>**contactInstructionsCA_RadiometryPreCorrection**</parameter>
<parameter>**contactInstructionsCA_SensorCharacteristics**</parameter>
<parameter>**contactInstructionsCA_SensorCharacteristics1**</parameter>
<parameter>**contactInstructionsMI_Instrument**</parameter>
<parameter>**contactInstructionsSD_Calibration**</parameter>
<parameter>**country**</parameter>
<parameter>**countryCA_Detector**</parameter>
<parameter>**countryCA_Detector1**</parameter>
<parameter>**countryCA_Radiation**</parameter>

<parameter>**countryCA_RadiometryInSensor**</parameter>
<parameter>**countryCA_RadiometryInSensor1**</parameter>
<parameter>**countryCA_RadiometryPreCorrection**</parameter>
<parameter>**countryCA_SensorCharacteristics**</parameter>
<parameter>**countryCA_SensorCharacteristics1**</parameter>
<parameter>**countryMI_Instrument**</parameter>
<parameter>**countrySD_Calibration**</parameter>
<parameter>**creditCA_Detector**</parameter>
<parameter>**creditCA_RadiometryInSensor**</parameter>
<parameter>**creditCA_SensorCharacteristics**</parameter>
<parameter>**dateTypeCA_Detector**</parameter>
<parameter>**dateTypeCA_Radiation**</parameter>
<parameter>**dateTypeCA_RadiometryInSensor**</parameter>
<parameter>**dateTypeCA_RadiometryPreCorrection**</parameter>
<parameter>**dateTypeCA_SensorCharacteristics**</parameter>
<parameter>**dateTypeMI_Instrument**</parameter>
<parameter>**deliveryPoint**</parameter>
<parameter>**deliveryPointCA_Detector**</parameter>
<parameter>**deliveryPointCA_Detector1**</parameter>
<parameter>**deliveryPointCA_Radiation**</parameter>
<parameter>**deliveryPointCA_RadiometryInSensor**</parameter>
<parameter>**deliveryPointCA_RadiometryInSensor1**</parameter>
<parameter>**deliveryPointCA_RadiometryPreCorrection**</parameter>
<parameter>**deliveryPointCA_SensorCharacteristics**</parameter>
<parameter>**deliveryPointCA_SensorCharacteristics1**</parameter>
<parameter>**deliveryPointMI_Instrument**</parameter>
<parameter>**deliveryPointSD_Calibration**</parameter>
<parameter>**descriptionCI_OnlineResource**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_Detector**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_Detector1**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_Radiation**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_RadiometryInSensor**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_RadiometryInSensor1**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_SensorCharacteristics**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_RadiometryPreCorrection**</parameter>
<parameter>**descriptionCI_OnlineResourceCA_SensorCharacteristics1**</parameter>
<parameter>**descriptionCI_OnlineResourceMI_Instrument**</parameter>
<parameter>**descriptionCI_OnlineResourceSD_Calibration**</parameter>
<parameter>**descriptionMI_Instrument**</parameter>
<parameter>**detectedPolarization**</parameter>
<parameter>**edition**</parameter>
<parameter>**editionCA_Detector**</parameter>
<parameter>**editionCA_Radiation**</parameter>
<parameter>**editionCA_RadiometryInSensor**</parameter>
<parameter>**editionCA_RadiometryPreCorrection**</parameter>
<parameter>**editionCA_SensorCharacteristics**</parameter>
<parameter>**editionMI_Instrument**</parameter>
<parameter>**electronicMailAddress**</parameter>
<parameter>**electronicMailAddressCA_Detector**</parameter>
<parameter>**electronicMailAddressCA_Detector1**</parameter>
<parameter>**electronicMailAddressCA_Radiation**</parameter>
<parameter>**electronicMailAddressCA_RadiometryInSensor**</parameter>
<parameter>**electronicMailAddressCA_RadiometryInSensor1**</parameter>
<parameter>**electronicMailAddressCA_RadiometryPreCorrection**</parameter>
<parameter>**electronicMailAddressCA_SensorCharacteristics**</parameter>
<parameter>**electronicMailAddressCA_SensorCharacteristics1**</parameter>
<parameter>**electronicMailAddressMI_Instrument**</parameter>
<parameter>**electronicMailAddressSD_Calibration**</parameter>
<parameter>**facsimile**</parameter>
<parameter>**facsimileCA_Detector**</parameter>
<parameter>**facsimileCA_Detector1**</parameter>
<parameter>**facsimileCA_Radiation**</parameter>
<parameter>**facsimileCA_RadiometryInSensor**</parameter>
<parameter>**facsimileCA_RadiometryInSensor1**</parameter>
<parameter>**facsimileCA_RadiometryPreCorrection**</parameter>
<parameter>**facsimileCA_SensorCharacteristics**</parameter>
<parameter>**facsimileCA_SensorCharacteristics1**</parameter>

<parameter>facsimileMI_Instrument</parameter>
<parameter>facsimileSD_Calibration</parameter>
<parameter>functionCA_Detector</parameter>
<parameter>functionCA_Detector1</parameter>
<parameter>functionCA_Radiation</parameter>
<parameter>functionCA_RadiometryInSensor</parameter>
<parameter>functionCA_RadiometryInSensor1</parameter>
<parameter>functionCA_RadiometryPreCorrection</parameter>
<parameter>functionCA_SensorCharacteristics</parameter>
<parameter>functionCA_SensorCharacteristics1</parameter>
<parameter>functionMI_Instrument</parameter>
<parameter>functionSD_Calibration</parameter>
<parameter>hoursOfService</parameter>
<parameter>hoursOfServiceCA_Detector</parameter>
<parameter>hoursOfServiceCA_Detector1</parameter>
<parameter>hoursOfServiceCA_Radiation</parameter>
<parameter>hoursOfServiceCA_RadiometryInSensor</parameter>
<parameter>hoursOfServiceCA_RadiometryInSensor1</parameter>
<parameter>hoursOfServiceCA_RadiometryPreCorrection</parameter>
<parameter>hoursOfServiceCA_SensorCharacteristics</parameter>
<parameter>hoursOfServiceCA_SensorCharacteristics1</parameter>
<parameter>hoursOfServiceMI_Instrument</parameter>
<parameter>hoursOfServiceSD_Calibration</parameter>
<parameter>individualName</parameter>
<parameter>individualNameCA_Detector</parameter>
<parameter>individualNameCA_Detector1</parameter>
<parameter>individualNameCA_Radiation</parameter>
<parameter>individualNameCA_RadiometryInSensor</parameter>
<parameter>individualNameCA_RadiometryInSensor1</parameter>
<parameter>individualNameCA_RadiometryPreCorrection</parameter>
<parameter>individualNameCA_SensorCharacteristics</parameter>
<parameter>individualNameCA_SensorCharacteristics1</parameter>
<parameter>individualNameMI_Instrument</parameter>
<parameter>individualNameSD_Calibration</parameter>
<parameter>ISBN</parameter>
<parameter>ISBNCA_Detector</parameter>
<parameter>ISBNCA_Radiation</parameter>
<parameter>ISBNCA_RadiometryInSensor</parameter>
<parameter>ISBNCA_RadiometryPreCorrection</parameter>
<parameter>ISBNCA_SensorCharacteristics</parameter>
<parameter>ISBNMI_Instrument</parameter>
<parameter>ISSN</parameter>
<parameter>ISSNCA_Detector</parameter>
<parameter>ISSNCA_Radiation</parameter>
<parameter>ISSNCA_RadiometryInSensor</parameter>
<parameter>ISSNCA_RadiometryPreCorrection</parameter>
<parameter>ISSNCA_SensorCharacteristics</parameter>
<parameter>ISSNMI_Instrument</parameter>
<parameter>issueIdentification</parameter>
<parameter>issueIdentificationCA_Detector</parameter>
<parameter>issueIdentificationCA_Radiation</parameter>
<parameter>issueIdentificationCA_RadiometryInSensor</parameter>
<parameter>issueIdentificationCA_RadiometryPreCorrection</parameter>
<parameter>issueIdentificationCA_SensorCharacteristics</parameter>
<parameter>issueIdentificationMI_Instrument</parameter>
<parameter>linkage</parameter>
<parameter>linkageCA_Detector</parameter>
<parameter>linkageCA_Detector1</parameter>
<parameter>linkageCA_Radiation</parameter>
<parameter>linkageCA_RadiometryInSensor</parameter>
<parameter>linkageCA_RadiometryInSensor1</parameter>
<parameter>linkageCA_RadiometryPreCorrection</parameter>
<parameter>linkageCA_SensorCharacteristics</parameter>
<parameter>linkageCA_SensorCharacteristics1</parameter>
<parameter>linkageMI_Instrument</parameter>
<parameter>linkageSD_Calibration</parameter>
<parameter>nameCI_OnlineResource</parameter>

<parameter>**nameCI_OnlineResourceCA_Detector**</parameter>
<parameter>**nameCI_OnlineResourceCA_Detector1**</parameter>
<parameter>**nameCI_OnlineResourceCA_Radiation**</parameter>
<parameter>**nameCI_OnlineResourceCA_RadiometryInSensor**</parameter>
<parameter>**nameCI_OnlineResourceCA_RadiometryInSensor1**</parameter>
<parameter>**nameCI_OnlineResourceCA_RadiometryPreCorrection**</parameter>
<parameter>**nameCI_OnlineResourceCA_SensorCharacteristics**</parameter>
<parameter>**nameCI_OnlineResourceCA_SensorCharacteristics1**</parameter>
<parameter>**nameCI_OnlineResourceMI_Instrument**</parameter>
<parameter>**nameCI_OnlineResourceSD_Calibration**</parameter>
<parameter>**nameCI_Series**</parameter>
<parameter>**nameCI_SeriesCA_Detector**</parameter>
<parameter>**nameCI_SeriesCA_Radiation**</parameter>
<parameter>**nameCI_SeriesCA_RadiometryInSensor**</parameter>
<parameter>**nameCI_SeriesCA_RadiometryPreCorrection**</parameter>
<parameter>**nameCI_SeriesCA_SensorCharacteristics**</parameter>
<parameter>**nameCI_SeriesMI_Instrument**</parameter>
<parameter>**nameSD_ArrayDimension**</parameter>
<parameter>**nameSD_ArrayDimension1**</parameter>
<parameter>**nameSD_ArrayDimension2**</parameter>
<parameter>**organisationName**</parameter>
<parameter>**organisationNameCA_Detector**</parameter>
<parameter>**organisationNameCA_Detector1**</parameter>
<parameter>**organisationNameCA_Radiation**</parameter>
<parameter>**organisationNameCA_RadiometryInSensor**</parameter>
<parameter>**organisationNameCA_RadiometryInSensor1**</parameter>
<parameter>**organisationNameCA_RadiometryPreCorrection**</parameter>
<parameter>**organisationNameCA_SensorCharacteristics**</parameter>
<parameter>**organisationNameCA_SensorCharacteristics1**</parameter>
<parameter>**organisationNameMI_Instrument**</parameter>
<parameter>**organisationNameSD_Calibration**</parameter>
<parameter>**otherCitationDetails**</parameter>
<parameter>**otherCitationDetailsCA_Detector**</parameter>
<parameter>**otherCitationDetailsCA_Radiation**</parameter>
<parameter>**otherCitationDetailsCA_RadiometryInSensor**</parameter>
<parameter>**otherCitationDetailsCA_RadiometryPreCorrection**</parameter>
<parameter>**otherCitationDetailsCA_SensorCharacteristics**</parameter>
<parameter>**otherCitationDetailsCA_SensorCharacteristics1**</parameter>
<parameter>**otherCitationDetailsMI_Instrument**</parameter>
<parameter>**page**</parameter>
<parameter>**pageCA_Detector**</parameter>
<parameter>**pageCA_Radiation**</parameter>
<parameter>**pageCA_RadiometryInSensor**</parameter>
<parameter>**pageCA_RadiometryPreCorrection**</parameter>
<parameter>**pageCA_SensorCharacteristics**</parameter>
<parameter>**pageMI_Instrument**</parameter>
<parameter>**positionName**</parameter>
<parameter>**positionNameCA_Detector**</parameter>
<parameter>**positionNameCA_Detector1**</parameter>
<parameter>**positionNameCA_Radiation**</parameter>
<parameter>**positionNameCA_RadiometryInSensor**</parameter>
<parameter>**positionNameCA_RadiometryInSensor1**</parameter>
<parameter>**positionNameCA_RadiometryPreCorrection**</parameter>
<parameter>**positionNameCA_SensorCharacteristics**</parameter>
<parameter>**positionNameCA_SensorCharacteristics1**</parameter>
<parameter>**positionNameMI_Instrument**</parameter>
<parameter>**positionNameSD_Calibration**</parameter>
<parameter>**postalCode**</parameter>
<parameter>**postalCodeCA_Detector**</parameter>
<parameter>**postalCodeCA_Detector1**</parameter>
<parameter>**postalCodeCA_Radiation**</parameter>
<parameter>**postalCodeCA_RadiometryInSensor**</parameter>
<parameter>**postalCodeCA_RadiometryInSensor1**</parameter>
<parameter>**postalCodeCA_RadiometryPreCorrection**</parameter>
<parameter>**postalCodeCA_SensorCharacteristics**</parameter>
<parameter>**postalCodeCA_SensorCharacteristics1**</parameter>
<parameter>**postalCodeMI_Instrument**</parameter>

<parameter>**postalCodeSD_Calibration**</parameter>
<parameter>**presentationFormCA_Detector**</parameter>
<parameter>**presentationFormCA_Radiation**</parameter>
<parameter>**presentationFormCA_RadiometryInSensor**</parameter>
<parameter>**presentationFormCA_RadiometryPreCorrection**</parameter>
<parameter>**presentationFormCA_SensorCharacteristics**</parameter>
<parameter>**presentationFormMI_Instrument**</parameter>
<parameter>**protocol**</parameter>
<parameter>**protocolCA_Detector**</parameter>
<parameter>**protocolCA_Detector1**</parameter>
<parameter>**protocolCA_Radiation**</parameter>
<parameter>**protocolCA_RadiometryInSensor**</parameter>
<parameter>**protocolCA_RadiometryInSensor1**</parameter>
<parameter>**protocolCA_RadiometryPreCorrection**</parameter>
<parameter>**protocolCA_SensorCharacteristics**</parameter>
<parameter>**protocolCA_SensorCharacteristics1**</parameter>
<parameter>**protocolMI_Instrument**</parameter>
<parameter>**protocolSD_Calibration**</parameter>
<parameter>**purpose**</parameter>
<parameter>**purposeCA_Detector**</parameter>
<parameter>**purposeCA_RadiometryInSensor**</parameter>
<parameter>**purposeCA_SensorCharacteristics**</parameter>
<parameter>**resultDimension1**</parameter>
<parameter>**resultDimension2**</parameter>
<parameter>**roleCA_Detector**</parameter>
<parameter>**roleCA_Detector1**</parameter>
<parameter>**roleCA_Radiation**</parameter>
<parameter>**roleCA_RadiometryInSensor**</parameter>
<parameter>**roleCA_RadiometryInSensor1**</parameter>
<parameter>**roleCA_RadiometryPreCorrection**</parameter>
<parameter>**roleCA_SensorCharacteristics**</parameter>
<parameter>**roleCA_SensorCharacteristics1**</parameter>
<parameter>**roleMI_Instrument**</parameter>
<parameter>**roleSD_Calibration**</parameter>
<parameter>**standaloneQualityReportDetails**</parameter>
<parameter>**standaloneQualityReportDetailsCA_Documentation**</parameter>
<parameter>**standaloneQualityReportDetailsSD_Distortion**</parameter>
<parameter>**standaloneQualityReportDetailsSD_DistortionPolynomial**</parameter>
<parameter>**standaloneQualityReportDetailsSD_DistortionPolynomial1**</parameter>
<parameter>**standaloneQualityReportDetailsSD_OpticalSystem**</parameter>
<parameter>**standaloneQualityReportDetailsSD_OpticalSystem1**</parameter>
<parameter>**statusCA_Detector**</parameter>
<parameter>**statusCA_RadiometryInSensor**</parameter>
<parameter>**statusCA_SensorCharacteristics**</parameter>
<parameter>**title**</parameter>
<parameter>**titleCA_Detector**</parameter>
<parameter>**titleCA_Radiation**</parameter>
<parameter>**titleCA_RadiometryInSensor**</parameter>
<parameter>**titleCA_RadiometryPreCorrection**</parameter>
<parameter>**titleCA_SensorCharacteristics**</parameter>
<parameter>**titleMI_Instrument**</parameter>
<parameter>**transferFunctionType**</parameter>
<parameter>**transmittedPolarization**</parameter>
<parameter>**voice**</parameter>
<parameter>**voiceCA_Detector**</parameter>
<parameter>**voiceCA_Detector1**</parameter>
<parameter>**voiceCA_Radiation**</parameter>
<parameter>**voiceCA_RadiometryInSensor**</parameter>
<parameter>**voiceCA_RadiometryInSensor1**</parameter>
<parameter>**voiceCA_RadiometryPreCorrection**</parameter>
<parameter>**voiceCA_SensorCharacteristics**</parameter>
<parameter>**voiceCA_SensorCharacteristics1**</parameter>
<parameter>**voiceMI_Instrument**</parameter>
<parameter>**voiceSD_Calibration**</parameter>

<parameter>**artefacts**</parameter>
<parameter>**atmosphericConditionCA_Radiation**</parameter>

<parameter>**atmosphericConditionCA_RadiometryInFlight**</parameter>
<parameter>**atmosphericModelCA_Radiation**</parameter>
<parameter>**atmosphericModelCA_RadiometryOffSensor**</parameter>
<parameter>**calibrationInstrument**</parameter>
<parameter>**calibrationMethod**</parameter>
<parameter>**calibrationType**</parameter>
<parameter>**cameraHead**</parameter>
<parameter>**channel**</parameter>
<parameter>**channelIdentification**</parameter>
<parameter>**cleanness**</parameter>
<parameter>**colourAberration**</parameter>
<parameter>**colourTransformation**</parameter>
<parameter>**darkSignalNonUniformity**</parameter>
<parameter>**dataProductLevel**</parameter>
<parameter>**descriptionCA_AirforcePattern**</parameter>
<parameter>**descriptionCA_GeometricTarget**</parameter>
<parameter>**descriptionCA_Siemensstar**</parameter>
<parameter>**detectorShape**</parameter>
<parameter>**equipment**</parameter>
<parameter>**errorTypeCA_Documentation**</parameter>
<parameter>**errorTypeCA_PositionalError**</parameter>
<parameter>**errorTypeCA_TestRange**</parameter>
<parameter>**errorTypeDarkSignalNonUniformity**</parameter>
<parameter>**filterType**</parameter>
<parameter>**geometryCalibrationType**</parameter>
<parameter>**identification**</parameter>
<parameter>**illumination**</parameter>
<parameter>**lampType**</parameter>
<parameter>**lightFalloff**</parameter>
<parameter>**material**</parameter>
<parameter>**materialCA_AirforcePattern**</parameter>
<parameter>**materialCA_Siemensstar**</parameter>
<parameter>**measurementMethodMTF**</parameter>
<parameter>**measurementMethodPSF**</parameter>
<parameter>**method**</parameter>
<parameter>**mode**</parameter>
<parameter>**modelType**</parameter>
<parameter>**modelProperties**</parameter>
<parameter>**paintType**</parameter>
<parameter>**paintTypeCA_AirforcePattern**</parameter>
<parameter>**paintTypeCA_Siemensstar**</parameter>
<parameter>**pixelResponseNonUniformity**</parameter>
<parameter>**pointSuspension**</parameter>
<parameter>**pointTypeCA_Documentation**</parameter>
<parameter>**pointTypeCA_PositionalError**</parameter>
<parameter>**pointTypeCA_TestRange**</parameter>
<parameter>**polarization**</parameter>
<parameter>**propertiesAlgorithm**</parameter>
<parameter>**quantityTypeCA_Documentation**</parameter>
<parameter>**quantityTypeCA_PositionalError**</parameter>
<parameter>**quantityTypeCA_TestRange**</parameter>
<parameter>**radiometricStability**</parameter>
<parameter>**radiometricTransformation**</parameter>
<parameter>**reflectanceProperties**</parameter>
<parameter>**reflectancePropertiesCA_AirforcePattern**</parameter>
<parameter>**reflectancePropertiesCA_Siemensstar**</parameter>
<parameter>**residualPolarization**</parameter>
<parameter>**rotationSequenceCA_IMU**</parameter>
<parameter>**rotationSequenceCA_SensorSystem**</parameter>
<parameter>**rotationSequenceSD_AngleAttitude**</parameter>
<parameter>**samplingPattern**</parameter>
<parameter>**selfCalibrationModel**</parameter>
<parameter>**sensitivity**</parameter>
<parameter>**sensitivityFunction**</parameter>
<parameter>**shapeCA_2DReflectanceTarget**</parameter>
<parameter>**shapeCA_PointSpreadFunction**</parameter>
<parameter>**shapeCA_PointSpreadFunctionCA_SensorParameters**</parameter>

```
<parameter>smile</parameter>
<parameter>software</parameter>
<parameter>solarIrradiance</parameter>
<parameter>spreading</parameter>
<parameter>spreadingCA_SensorParameters</parameter>
<parameter>stabilizedPlatform</parameter>
<parameter>strayLight</parameter>
<parameter>targetEnvironment</parameter>
<parameter>targetAccessibility</parameter>
<parameter>targetStability</parameter>
<parameter>tonalAdjustmentType</parameter>
<parameter>typeCA_AirforcePattern</parameter>
<parameter>typeCA_GeometricTarget</parameter>
<parameter>typeMI_Instrument</parameter>
<parameter>typeCA_Siemensstar</parameter>
<parameter>validationMethod</parameter>
<parameter>versionFirmwareCA_AuxiliaryDevice</parameter>
<parameter>versionFirmwareCA_GNSS</parameter>
<parameter>versionFirmwareCA_IMU</parameter>
<parameter>versionFirmwareCA_InteriorOrientation</parameter>
<parameter>versionFirmwareCA_SensorSystem</parameter>
<parameter>versionHardwareCA_AuxiliaryDevice</parameter>
<parameter>versionHardwareCA_GNSS</parameter>
<parameter>versionHardwareCA_IMU</parameter>
<parameter>versionHardwareCA_InteriorOrientation</parameter>
<parameter>versionHardwareCA_SensorSystem</parameter>
<parameter>viewshed</parameter>
</type>

<type>
<name>date</name>
<parameter>calibrationDateCameraHead1</parameter>
<parameter>calibrationDateCameraHead2</parameter>
<parameter>calibrationDateCameraHead3</parameter>
<parameter>calibrationDateCameraHead4</parameter>
<parameter>calibrationDateCameraHeadReference</parameter>
<parameter>dateOfAerialTriangulation</parameter>
<parameter>dateOfCertification</parameter>
<parameter>dateOfReport</parameter>

<parameter>dateCI_Date</parameter>
<parameter>dateCI_DateCA_Detector</parameter>
<parameter>dateCI_DateCA_Radiation</parameter>
<parameter>dateCI_DateCA_RadiometryInSensor</parameter>
<parameter>dateCI_DateCA_RadiometryPreCorrection</parameter>
<parameter>dateCI_DateCA_SensorCharacteristics</parameter>
<parameter>dateCI_DateMI_Instrument</parameter>
<parameter>dateEditionDate</parameter>
<parameter>dateEditionDateCA_Detector</parameter>
<parameter>dateEditionDateCA_Radiation</parameter>
<parameter>dateEditionDateCA_RadiometryInSensor</parameter>
<parameter>dateEditionDateCA_RadiometryPreCorrection</parameter>
<parameter>dateEditionDateCA_SensorCharacteristics</parameter>
<parameter>dateEditionDateMI_Instrument</parameter>

<parameter>calibrationDate</parameter>
<parameter>dataRate</parameter>
<parameter>geometryCalibrationDate</parameter>
<parameter>radiometricCalibrationDate</parameter>
<parameter>registrationCycle</parameter>
<parameter>resamplingDateCA_GeometricPreCorrection</parameter>
<parameter>resamplingDateCA_RadiometryPreCorrection</parameter>
<parameter>synchronizationCA_AuxiliaryDevice</parameter>
<parameter>synchronizationCA_GNSS</parameter>
<parameter>synchronizationCA_IMU</parameter>
<parameter>synchronizationCA_InteriorOrientation</parameter>
<parameter>synchronizationCA_SensorSystem</parameter>
```

```
<parameter>synchronizationErrorCA_AuxiliaryDevice</parameter>
<parameter>synchronizationErrorCA_GNSS</parameter>
<parameter>synchronizationErrorCA_IMU</parameter>
<parameter>synchronizationErrorCA_InteriorOrientation</parameter>
<parameter>synchronizationErrorCA_SensorSystem</parameter>
<parameter>timeLeverarmCA_AuxiliaryDevice</parameter>
<parameter>timeLeverarmCA_GNSS</parameter>
<parameter>timeLeverarmCA_IMU</parameter>
<parameter>validationTimeCA_GeometryValidation</parameter>
<parameter>validationTimeCA_RadiometryValidation</parameter>
</type>

<type>
<name>double</name>
<parameter>compersationOfLightFallOff</parameter>
<parameter>covPrincPtAutocollOthers</parameter>
<parameter>deviationFromTheLinearityCameraHead</parameter>
<parameter>deviationFromTheLinearityPAN</parameter>
<parameter>maxGroundResidualX</parameter>
<parameter>maxGroundResidualY</parameter>
<parameter>maxGroundResidualZ</parameter>
<parameter>maxRMSX</parameter>
<parameter>maxRMSY</parameter>
<parameter>maxRMSZ</parameter>
<parameter>meanStdDevObjectX</parameter>
<parameter>meanStdDevObjectY</parameter>
<parameter>meanStdDevObjectZ</parameter>
<parameter>meanStdDevPhotoAttitudeX</parameter>
<parameter>meanStdDevPhotoAttitudeY</parameter>
<parameter>meanStdDevPhotoAttitudeZ</parameter>
<parameter>meanStdDevPhotoPositionX</parameter>
<parameter>meanStdDevPhotoPositionY</parameter>
<parameter>meanStdDevPhotoPositionZ</parameter>
<parameter>modulationTransferFunctionCameraHead1</parameter>
<parameter>modulationTransferFunctionCameraHead2</parameter>
<parameter>modulationTransferFunctionCameraHead3</parameter>
<parameter>modulationTransferFunctionCameraHead4</parameter>
<parameter>modulationTransferFunctionPAN</parameter>
<parameter>princPointAutocollX</parameter>
<parameter>princPointAutocollY</parameter>
<parameter>qualityOfCalibratedFocalLengthOthers</parameter>
<parameter>relativeGrayvalueF2.8CameraHead1</parameter>
<parameter>relativeGrayvalueF2.8CameraHead2</parameter>
<parameter>relativeGrayvalueF2.8CameraHead3</parameter>
<parameter>relativeGrayvalueF2.8CameraHead4</parameter>
<parameter>relativeGrayvalueF4CameraHead1</parameter>
<parameter>relativeGrayvalueF4CameraHead2</parameter>
<parameter>relativeGrayvalueF4CameraHead3</parameter>
<parameter>relativeGrayvalueF4CameraHead4</parameter>
<parameter>relativeGrayvalueF5.6CameraHead1</parameter>
<parameter>relativeGrayvalueF5.6CameraHead2</parameter>
<parameter>relativeGrayvalueF5.6CameraHead3</parameter>
<parameter>relativeGrayvalueF5.6CameraHead4</parameter>
<parameter>relativeGrayvalueF5.6PAN</parameter>
<parameter>relativeGrayvalueF8CameraHead1</parameter>
<parameter>relativeGrayvalueF8CameraHead2</parameter>
<parameter>relativeGrayvalueF8CameraHead3</parameter>
<parameter>relativeGrayvalueF8CameraHead4</parameter>
<parameter>relativeGrayvalueF8PAN</parameter>
<parameter>relativeGrayvalueF11CameraHead1</parameter>
<parameter>relativeGrayvalueF11CameraHead2</parameter>
<parameter>relativeGrayvalueF11CameraHead3</parameter>
<parameter>relativeGrayvalueF11CameraHead4</parameter>
<parameter>relativeGrayvalueF11PAN</parameter>
<parameter>relativeGrayvalueF16CameraHead1</parameter>
<parameter>relativeGrayvalueF16CameraHead2</parameter>
<parameter>relativeGrayvalueF16CameraHead3</parameter>
```

<parameter>**relativeGrayvalueF16CameraHead4**</parameter>
<parameter>**relativeGrayvalueF16PAN**</parameter>
<parameter>**relativeGrayvalueF22CameraHead1**</parameter>
<parameter>**relativeGrayvalueF22CameraHead2**</parameter>
<parameter>**relativeGrayvalueF22CameraHead3**</parameter>
<parameter>**relativeGrayvalueF22CameraHead4**</parameter>
<parameter>**relativeGrayvalueF22PAN**</parameter>
<parameter>**relativeGrayvalueF32PAN**</parameter>
<parameter>**relativeSpectralResponseCameraHead1**</parameter>
<parameter>**relativeSpectralResponseCameraHead2**</parameter>
<parameter>**relativeSpectralResponseCameraHead3**</parameter>
<parameter>**relativeSpectralResponseCameraHead4**</parameter>
<parameter>**relativeSpectralResponsePAN**</parameter>
<parameter>**residualLimitsX**</parameter>
<parameter>**residualLimitsY**</parameter>
<parameter>**residualLimitsZ**</parameter>
<parameter>**rmsCheckX**</parameter>
<parameter>**rmsCheckY**</parameter>
<parameter>**rmsCheckZ**</parameter>
<parameter>**rmsControlX**</parameter>
<parameter>**rmsControlY**</parameter>
<parameter>**rmsControlZ**</parameter>
<parameter>**rmsImageX**</parameter>
<parameter>**rmsImageY**</parameter>
<parameter>**rmsLimitsX**</parameter>
<parameter>**rmsLimitsY**</parameter>
<parameter>**rmsLimitsZ**</parameter>
<parameter>**rmsPhotoAttitudeX**</parameter>
<parameter>**rmsPhotoAttitudeY**</parameter>
<parameter>**rmsPhotoAttitudeZ**</parameter>
<parameter>**rmsPhotoPositionX**</parameter>
<parameter>**rmsPhotoPositionY**</parameter>
<parameter>**rmsPhotoPositionZ**</parameter>
<parameter>**run-Spacing**</parameter>
<parameter>**spectrometerMeasuredRadianceCalPAN**</parameter>
<parameter>**spectrometerMeasuredRadianceNoCalPAN**</parameter>
<parameter>**temperatureForMTFCameraHead1**</parameter>
<parameter>**temperatureForMTFCameraHead2**</parameter>
<parameter>**temperatureForMTFCameraHead3**</parameter>
<parameter>**temperatureForMTFCameraHead4**</parameter>
<parameter>**temperatureForMTFPAN**</parameter>

<parameter>**nominalSpatialResolution**</parameter>

<parameter>**a1**</parameter>
<parameter>**a2**</parameter>
<parameter>**absoluteAccuracy**</parameter>
<parameter>**acrossStripOverlap**</parameter>
<parameter>**aerosolQuantity**</parameter>
<parameter>**alongStripOverlap**</parameter>
<parameter>**arrayOrigin**</parameter>
<parameter>**attitudeAccuracy**</parameter>
<parameter>**averageElevationCA_RadiometryTestRange**</parameter>
<parameter>**averageElevationCA_TestRange**</parameter>
<parameter>**azimuth**</parameter>
<parameter>**b**</parameter>
<parameter>**backgroundRadiance**</parameter>
<parameter>**base**</parameter>
<parameter>**c**</parameter>
<parameter>**calibratedFocalLength**</parameter>
<parameter>**controlPointCA_RadiometryTestRange**</parameter>
<parameter>**controlPointCA_TestRange**</parameter>
<parameter>**detectorSize1**</parameter>
<parameter>**detectorSize2**</parameter>
<parameter>**diameter**</parameter>
<parameter>**distortionValues**</parameter>
<parameter>**e1**</parameter>

<parameter>**e2**</parameter>
<parameter>**e3**</parameter>
<parameter>**e4**</parameter>
<parameter>**e5**</parameter>
<parameter>**e6**</parameter>
<parameter>**e7**</parameter>
<parameter>**e8**</parameter>
<parameter>**e9**</parameter>
<parameter>**e10**</parameter>
<parameter>**e11**</parameter>
<parameter>**e12**</parameter>
<parameter>**elevationChangeOfTestrange**</parameter>
<parameter>**errorDarkSignalNonUniformity**</parameter>
<parameter>**errorLeverarmCA_AuxiliaryDevice**</parameter>
<parameter>**errorLeverarmCA_GNSS**</parameter>
<parameter>**errorLeverarmCA_IMU**</parameter>
<parameter>**errorXCA_Documentation**</parameter>
<parameter>**errorXCA_PositionalError**</parameter>
<parameter>**errorXCA_TestRange**</parameter>
<parameter>**errorXYCA_Documentation**</parameter>
<parameter>**errorXYCA_PositionalError**</parameter>
<parameter>**errorXYCA_TestRange**</parameter>
<parameter>**errorXYZCA_Documentation**</parameter>
<parameter>**errorXYZCA_PositionalError**</parameter>
<parameter>**errorXYZCA_TestRange**</parameter>
<parameter>**errorYCA_Documentation**</parameter>
<parameter>**errorYCA_PositionalError**</parameter>
<parameter>**errorYCA_TestRange**</parameter>
<parameter>**errorZCA_Documentation**</parameter>
<parameter>**errorZCA_PositionalError**</parameter>
<parameter>**errorZCA_TestRange**</parameter>
<parameter>**expanse**</parameter>
<parameter>**f1**</parameter>
<parameter>**f2**</parameter>
<parameter>**flyingAltitudeAboveGround**</parameter>
<parameter>**flyingHeight**</parameter>
<parameter>**gain**</parameter>
<parameter>**gammaCorrection**</parameter>
<parameter>**geometricResolution**</parameter>
<parameter>**geometricResolutionCA_Documentation**</parameter>
<parameter>**geometricResolutionCA_Documentation1**</parameter>
<parameter>**geometricResolutionCA_OpticalSystem**</parameter>
<parameter>**groundSamplingDistance**</parameter>
<parameter>**illuminationLevel**</parameter>
<parameter>**intensity**</parameter>
<parameter>**j1**</parameter>
<parameter>**j2**</parameter>
<parameter>**j3**</parameter>
<parameter>**j4**</parameter>
<parameter>**j5**</parameter>
<parameter>**j6**</parameter>
<parameter>**j7**</parameter>
<parameter>**j8**</parameter>
<parameter>**j9**</parameter>
<parameter>**j10**</parameter>
<parameter>**j11**</parameter>
<parameter>**j12**</parameter>
<parameter>**j13**</parameter>
<parameter>**j14**</parameter>
<parameter>**j15**</parameter>
<parameter>**k**</parameter>
<parameter>**lengthOfTestrange**</parameter>
<parameter>**leverarmCA_AuxiliaryDevice**</parameter>
<parameter>**leverarmCA_GNSS**</parameter>
<parameter>**leverarmCA_IMU**</parameter>
<parameter>**linearSize**</parameter>
<parameter>**matrixElements1**</parameter>

<parameter>**matrixElements1CA_IMU**</parameter>
<parameter>**matrixElements1CA_SensorSystem**</parameter>
<parameter>**matrixElements2**</parameter>
<parameter>**matrixElements2CA_IMU**</parameter>
<parameter>**matrixElements2CA_SensorSystem**</parameter>
<parameter>**matrixElements3**</parameter>
<parameter>**matrixElements3CA_IMU**</parameter>
<parameter>**matrixElements3CA_SensorSystem**</parameter>
<parameter>**matrixElements4**</parameter>
<parameter>**matrixElements4CA_IMU**</parameter>
<parameter>**matrixElements4CA_SensorSystem**</parameter>
<parameter>**matrixElements5**</parameter>
<parameter>**matrixElements5CA_IMU**</parameter>
<parameter>**matrixElements5CA_SensorSystem**</parameter>
<parameter>**matrixElements6**</parameter>
<parameter>**matrixElements6CA_IMU**</parameter>
<parameter>**matrixElements6CA_SensorSystem**</parameter>
<parameter>**matrixElements7**</parameter>
<parameter>**matrixElements7CA_IMU**</parameter>
<parameter>**matrixElements7CA_SensorSystem**</parameter>
<parameter>**matrixElements8**</parameter>
<parameter>**matrixElements8CA_IMU**</parameter>
<parameter>**matrixElements8CA_SensorSystem**</parameter>
<parameter>**matrixElements9**</parameter>
<parameter>**matrixElements9CA_IMU**</parameter>
<parameter>**matrixElements9CA_SensorSystem**</parameter>
<parameter>**maximumBarWidth**</parameter>
<parameter>**maximumElevationCA_RadiometryTestRange**</parameter>
<parameter>**maximumElevationCA_TestRange**</parameter>
<parameter>**maximumGreyValue**</parameter>
<parameter>**maximumNominalReflectance**</parameter>
<parameter>**maximumWavelength**</parameter>
<parameter>**maxWavelength**</parameter>
<parameter>**minimumBarWidth**</parameter>
<parameter>**minimumElevationCA_RadiometryTestRange**</parameter>
<parameter>**minimumElevationCA_TestRange**</parameter>
<parameter>**minimumGreyValue**</parameter>
<parameter>**minimumNominalReflectance**</parameter>
<parameter>**minimumWavelength**</parameter>
<parameter>**minWavelength**</parameter>
<parameter>**modulationTransferFunction**</parameter>
<parameter>**modulationTransferFunctionAcross**</parameter>
<parameter>**modulationTransferFunctionAlong**</parameter>
<parameter>**offset**</parameter>
<parameter>**offsetVectors1**</parameter>
<parameter>**offsetVectors2**</parameter>
<parameter>**p1**</parameter>
<parameter>**p2**</parameter>
<parameter>**parametersCA_GeometricPreCorrection**</parameter>
<parameter>**parametersCA_RadiometryPreCorrection**</parameter>
<parameter>**pathRadiance**</parameter>
<parameter>**photoScale**</parameter>
<parameter>**polynomialCoefficients**</parameter>
<parameter>**positionInImage**</parameter>
<parameter>**princPointAutocoll**</parameter>
<parameter>**princPointOfSymmetry**</parameter>
<parameter>**radianceAtSatellite**</parameter>
<parameter>**receivedIntensity**</parameter>
<parameter>**recordedIntensity**</parameter>
<parameter>**relativePosition**</parameter>
<parameter>**relativeSpectralError**</parameter>
<parameter>**response**</parameter>
<parameter>**responseCA_2DReflectanceTarget**</parameter>
<parameter>**responseCA_OpticalFilters**</parameter>
<parameter>**responseCA_SensorParameters**</parameter>
<parameter>**rmse**</parameter>
<parameter>**rmseComparisonObject**</parameter>

```
<parameter>rotationAngleXCA_IMU</parameter>
<parameter>rotationAngleXCA_SensorSystem</parameter>
<parameter>rotationAngleXSD_AngleAttitude</parameter>
<parameter>rotationAngleYCA_IMU</parameter>
<parameter>rotationAngleYCA_SensorSystem</parameter>
<parameter>rotationAngleYSD_AngleAttitude</parameter>
<parameter>rotationAngleZCA_IMU</parameter>
<parameter>rotationAngleZCA_SensorSystem</parameter>
<parameter>rotationAngleZSD_AngleAttitude</parameter>
<parameter>sector</parameter>
<parameter>sigmaNaught</parameter>
<parameter>sizeCA_AirforcePattern</parameter>
<parameter>sizeCA_GeometricTarget</parameter>
<parameter>sizeCA_Siemensstar</parameter>
<parameter>skylight</parameter>
<parameter>skylightReflected</parameter>
<parameter>skyViewFactor</parameter>
<parameter>solarAzimuth</parameter>
<parameter>solarIncidentAngle</parameter>
<parameter>solarZenithAngle</parameter>
<parameter>stitchingResiduals</parameter>
<parameter>sunRadiationAtTopOfAtmosphere</parameter>
<parameter>t1</parameter>
<parameter>t2</parameter>
<parameter>targetAltitude</parameter>
<parameter>targetAzimuth</parameter>
<parameter>targetExpanse</parameter>
<parameter>targetInclination</parameter>
<parameter>temperature</parameter>
<parameter>temperatureCA_AuxiliaryDevice</parameter>
<parameter>temperatureCA_GNSS</parameter>
<parameter>temperatureCA_IMU</parameter>
<parameter>temperatureCA_InteriorOrientation</parameter>
<parameter>temperatureCA_SensorSystem</parameter>
<parameter>temperatureCA_SensorSystem1</parameter>
<parameter>temperatureCA_SensorSystem2</parameter>
<parameter>temperatureMaximumTemperature</parameter>
<parameter>temperatureMinimumTemperature</parameter>
<parameter>terrainHeight</parameter>
<parameter>thinSplineCoefficients</parameter>
<parameter>transmittanceTargetToSatellite</parameter>
<parameter>transmittanceSunToTarget</parameter>
<parameter>virtualFocalLength</parameter>
<parameter>virtualPixelSize</parameter>
<parameter>virtualPrincipalPointAutocoll</parameter>
<parameter>virtualSensorSize</parameter>
<parameter>wavelengthCA_Spectrum</parameter>
<parameter>wavelengthCA_SpectrumCA_2DReflectanceTarget</parameter>
<parameter>wavelengthCA_SpectrumCA_OpticalFilters</parameter>
<parameter>wavelengthCA_SpectrumCA_SensorParameters</parameter>
<parameter>wavelengthCA_MeasuredReflectance</parameter>
<parameter>widthOfTestrange</parameter>
<parameter>zenithAngle</parameter>
</type>

<type>
<name>integer</name>
<parameter>ccdRevision</parameter>
<parameter>columnPAN</parameter>
<parameter>columnCameraHead1</parameter>
<parameter>columnCameraHead2</parameter>
<parameter>columnCameraHead3</parameter>
<parameter>columnCameraHead4</parameter>
<parameter>dataNumberCameraHead1</parameter>
<parameter>dataNumberCameraHead2</parameter>
<parameter>dataNumberCameraHead3</parameter>
<parameter>dataNumberCameraHead4</parameter>
```

<parameter>**dataNumberPAN**</parameter>
<parameter>**dateDefectPixel**</parameter>
<parameter>**degreesOfFreedom**</parameter>
<parameter>**exposureTimePAN**</parameter>
<parameter>**exposureTimeCameraHead**</parameter>
<parameter>**grayvalueCameraHeadIntermediate**</parameter>
<parameter>**grayvalueCameraHeadRaw**</parameter>
<parameter>**grossImageBlunders**</parameter>
<parameter>**grossControlBlunders**</parameter>
<parameter>**imageBlunders**</parameter>
<parameter>**imageBrightnessAfterNormalizationCameraHead**</parameter>
<parameter>**imageBrightnessBeforeNormalizationCameraHead**</parameter>
<parameter>**imageNoiseApertureCameraHead**</parameter>
<parameter>**imageNoiseAperturePAN**</parameter>
<parameter>**imagePointsUsed**</parameter>
<parameter>**lightCameraHeadIntermediate**</parameter>
<parameter>**lightCameraHeadRaw**</parameter>
<parameter>**maxDoubleColumnCameraHead**</parameter>
<parameter>**maxDoubleColumnPAN**</parameter>
<parameter>**maximumAllowedDefectPixelsPAN**</parameter>
<parameter>**maximumAllowedDefectPixelsCameraHead**</parameter>
<parameter>**maxSingleColumnCameraHead**</parameter>
<parameter>**maxSingleColumnPAN**</parameter>
<parameter>**noiseCameraAfterNormalizationCameraHead**</parameter>
<parameter>**noiseCameraBeforeNormalizationCameraHead**</parameter>
<parameter>**numberOfColumns**</parameter>
<parameter>**numberOfDefectClustersCameraHead1**</parameter>
<parameter>**numberOfDefectClustersCameraHead2**</parameter>
<parameter>**numberOfDefectClustersCameraHead3**</parameter>
<parameter>**numberOfDefectClustersCameraHead4**</parameter>
<parameter>**numberOfDefectClustersPAN**</parameter>
<parameter>**numberOfDefectColumnsCameraHead1**</parameter>
<parameter>**numberOfDefectColumnsCameraHead2**</parameter>
<parameter>**numberOfDefectColumnsCameraHead3**</parameter>
<parameter>**numberOfDefectColumnsCameraHead4**</parameter>
<parameter>**numberOfDefectColumnsPAN**</parameter>
<parameter>**numberOfDefectPixelsCameraHead1**</parameter>
<parameter>**numberOfDefectPixelsCameraHead2**</parameter>
<parameter>**numberOfDefectPixelsCameraHead3**</parameter>
<parameter>**numberOfDefectPixelsCameraHead4**</parameter>
<parameter>**numberOfDefectPixelsPAN**</parameter>
<parameter>**numberOfPhotosAlongStripNS**</parameter>
<parameter>**numberOfPhotosAlongStripWE**</parameter>
<parameter>**numberOfRows**</parameter>
<parameter>**numberOfIteration**</parameter>
<parameter>**photosNotUsed**</parameter>
<parameter>**pixelSizeX**</parameter>
<parameter>**pixelSizeY**</parameter>
<parameter>**radiusF2.8CameraHead1**</parameter>
<parameter>**radiusF2.8CameraHead2**</parameter>
<parameter>**radiusF2.8CameraHead3**</parameter>
<parameter>**radiusF2.8CameraHead4**</parameter>
<parameter>**radiusF4CameraHead1**</parameter>
<parameter>**radiusF4CameraHead2**</parameter>
<parameter>**radiusF4CameraHead3**</parameter>
<parameter>**radiusF4CameraHead4**</parameter>
<parameter>**radiusF5.6CameraHead1**</parameter>
<parameter>**radiusF5.6CameraHead2**</parameter>
<parameter>**radiusF5.6CameraHead3**</parameter>
<parameter>**radiusF5.6CameraHead4**</parameter>
<parameter>**radiusF5.6PAN**</parameter>
<parameter>**radiusF8CameraHead1**</parameter>
<parameter>**radiusF8CameraHead2**</parameter>
<parameter>**radiusF8CameraHead3**</parameter>
<parameter>**radiusF8CameraHead4**</parameter>
<parameter>**radiusF8PAN**</parameter>
<parameter>**radiusF11CameraHead1**</parameter>

<parameter>**radiusF11CameraHead2**</parameter>
<parameter>**radiusF11CameraHead3**</parameter>
<parameter>**radiusF11CameraHead4**</parameter>
<parameter>**radiusF11PAN**</parameter>
<parameter>**radiusF16CameraHead1**</parameter>
<parameter>**radiusF16CameraHead2**</parameter>
<parameter>**radiusF16CameraHead3**</parameter>
<parameter>**radiusF16CameraHead4**</parameter>
<parameter>**radiusF16PAN**</parameter>
<parameter>**radiusF22CameraHead1**</parameter>
<parameter>**radiusF22CameraHead2**</parameter>
<parameter>**radiusF22CameraHead3**</parameter>
<parameter>**radiusF22CameraHead4**</parameter>
<parameter>**radiusF22PAN**</parameter>
<parameter>**radiusF32PAN**</parameter>
<parameter>**revisionOfCalibration**</parameter>
<parameter>**rowCameraHead1**</parameter>
<parameter>**rowCameraHead2**</parameter>
<parameter>**rowCameraHead3**</parameter>
<parameter>**rowCameraHead4**</parameter>
<parameter>**rowPAN**</parameter>
<parameter>**signalToNoiseRatioCalPAN**</parameter>
<parameter>**signalToNoiseRatioNoCalPAN**</parameter>
<parameter>**sizeSD_ArrayDimension**</parameter>
<parameter>**sizeSD_ArrayDimension1**</parameter>
<parameter>**sizeSD_ArrayDimension2**</parameter>
<parameter>**temperatureStabilityCameraHead**</parameter>
<parameter>**temperatureStabilityPAN**</parameter>
<parameter>**wavelengthCameraHead1**</parameter>
<parameter>**wavelengthCameraHead2**</parameter>
<parameter>**wavelengthCameraHead3**</parameter>
<parameter>**wavelengthCameraHead4**</parameter>
<parameter>**wavelengthPAN**</parameter>

<parameter>**absoluteSpectralError**</parameter>
<parameter>**bit**</parameter>
<parameter>**bitRadiomatricDynamics**</parameter>
<parameter>**bitSignalToNoiseRatio**</parameter>
<parameter>**case**</parameter>
<parameter>**checkPoint**</parameter>
<parameter>**column**</parameter>
<parameter>**columnDefectPixels**</parameter>
<parameter>**columnDefectPixelsBrightImage**</parameter>
<parameter>**columnDefectPixelsDarkImage**</parameter>
<parameter>**columns**</parameter>
<parameter>**fNumberDenominator**</parameter>
<parameter>**in**</parameter>
<parameter>**maximumAllowedDefectPixels**</parameter>
<parameter>**maximumAllowedDefectPixelsDoubleColumn**</parameter>
<parameter>**maximumAllowedDefectPixelsSingleColumn**</parameter>
<parameter>**numberBands**</parameter>
<parameter>**numberBandsCA_2DReflectanceTarget**</parameter>
<parameter>**numberBandsCA_OpticalFilters**</parameter>
<parameter>**numberBandsCA_SensorParameters**</parameter>
<parameter>**numberCheckPoints**</parameter>
<parameter>**numberCoefficients**</parameter>
<parameter>**numberControlPoints**</parameter>
<parameter>**numberImages**</parameter>
<parameter>**numberOfBarsInBox**</parameter>
<parameter>**numberOfBarsInSector**</parameter>
<parameter>**numberOfBoxes**</parameter>
<parameter>**numberOfDimensions**</parameter>
<parameter>**numberOfPhotos**</parameter>
<parameter>**numberOfPhotosAlongStrip**</parameter>
<parameter>**numberOfPhotoFlights**</parameter>
<parameter>**numberOfPhotosUsed**</parameter>
<parameter>**numberOfPieces**</parameter>

```
<parameter>numberOfStrips</parameter>
<parameter>numberPoints</parameter>
<parameter>numberSatellites</parameter>
<parameter>numberSensorHeads</parameter>
<parameter>out</parameter>
<parameter>polynomialDegree</parameter>
<parameter>row</parameter>
<parameter>rowDefectPixels</parameter>
<parameter>rowDefectPixelsBrightImage</parameter>
<parameter>rowDefectPixelsDarkImage</parameter>
<parameter>rows</parameter>
<parameter>signOfGain</parameter>
<parameter>thinSplineDegree</parameter>
<parameter>xOffset</parameter>
<parameter>xSpacing</parameter>
<parameter>yOffset</parameter>
<parameter>ySpacing</parameter>
</type>

<type>
<name>boolean</name>
<parameter>projectSettingsCurvature</parameter>
<parameter>projectSettingsRefraction</parameter>

<parameter>antiBlooming</parameter>
<parameter>keystoneEffect</parameter>
<parameter>rotatedAxesCA_IMU</parameter>
<parameter>rotatedAxesCA_SensorSystem</parameter>
<parameter>rotatedAxesSD_AngleAttitude</parameter>
</type>
</dataTypes>
```

Anhang D
Die Quelltextdatei des Softwareprogramms: RaportGenerator.java

```
package report_generator;

public class ReportGenerator {
    public static void main(String[] args) {
        program.setInputXmlPath("C:\\Report\\Input.xml");
        program.setTypesXmlPath("C:\\Report\\Types.xml");
        program.setOthersXmlPath("C:\\Report\\Others.xml");
        program.setOutputPdfPath("C:\\Report\\Report.pdf");
        program.initParameters();
        manualInitialization();
        program.getValuesFromUser();
    }

    public static void manualInitialization() {
        program.setPossibleValues("bandBoundaryDefinition", "3dB", "halfMaximum",
        "fiftyPercent", "oneOverE", "equivalentWidth");
        program.setPossibleValues("dateTypeCA_Detector", "creation", "publication",
        "revision");
        program.setPossibleValues("dateTypeCA_Radiation", "creation", "publication",
        "revision");
        program.setPossibleValues("dateTypeCA_RadiometryInSensor", "creation",
        "publication", "revision");
        program.setPossibleValues("dateTypeCA_RadiometryPreCorrection", "creation",
        "publication", "revision");
        program.setPossibleValues("dateTypeCA_SensorCharacteristics", "creation",
        "publication", "revision");
        program.setPossibleValues("dateTypeMI_Instrument", "creation", "publication",
        "revision");
        program.setPossibleValues("detectedPolarization", "horizontal", "vertical",
        "leftCircular", "rightCircular", "theta", "phi");
        program.setPossibleValues("functionCA_Detector", "download", "information",
        "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_Detector1", "download", "information",
        "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_Radiation", "download", "information",
        "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_RadiometryInSensor", "download",
        "information", "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_RadiometryInSensor1", "download",
        "information", "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_RadiometryPreCorrection", "download",
        "information", "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_SensorCharacteristics", "download",
        "information", "offlineAccess", "order", "search");
        program.setPossibleValues("functionCA_SensorCharacteristics1", "download",
        "information", "offlineAccess", "order", "search");
        program.setPossibleValues("functionMI_Instrument", "download", "information",
        "offlineAccess", "order", "search");
        program.setPossibleValues("functionSD_Calibration", "download", "information",
        "offlineAccess", "order", "search");
        program.setPossibleValues("presentationFormCA_Detector", "documentDigital",
        "documentHardcopy", "imageDigital", "imageHardcopy", "mapDigital", "mapHardcopy",
        "modelDigital", "modelHardcopy", "profileDigital", "profileHardcopy",
        "tableDigital","tableHardcopy", "videoDigital", "videoHardcopy");
        program.setPossibleValues("presentationFormCA_Radiation", "documentDigital",
        "documentHardcopy", "imageDigital", "imageHardcopy", "mapDigital", "mapHardcopy",
        "modelDigital", "modelHardcopy", "profileDigital", "profileHardcopy",
        "tableDigital","tableHardcopy", "videoDigital", "videoHardcopy");
        program.setPossibleValues("presentationFormCA_RadiometryInSensor",
        "documentDigital", "documentHardcopy", "imageDigital", "imageHardcopy",
        "mapDigital", "mapHardcopy", "modelDigital", "modelHardcopy", "profileDigital",
        "profileHardcopy", "tableDigital","tableHardcopy", "videoDigital", "videoHardcopy");
        program.setPossibleValues("presentationFormCA_RadiometryPreCorrection",
        "documentDigital", "documentHardcopy", "imageDigital", "imageHardcopy",
```

```
"mapDigital", "mapHardcopy", "modelDigital", "modelHardcopy", "profileDigital",
"profileHardcopy", "tableDigital","tableHardcopy", "videoDigital", "videoHardcopy");
program.setPossibleValues("presentationFormCA_SensorCharacteristics",
"documentDigital", "documentHardcopy", "imageDigital", "imageHardcopy",
"mapDigital", "mapHardcopy", "modelDigital", "modelHardcopy", "profileDigital",
"profileHardcopy", "tableDigital","tableHardcopy", "videoDigital", "videoHardcopy");
program.setPossibleValues("presentationFormMI_Instrument", "documentDigital",
"documentHardcopy", "imageDigital", "imageHardcopy", "mapDigital", "mapHardcopy",
"modelDigital", "modelHardcopy", "profileDigital", "profileHardcopy",
"tableDigital","tableHardcopy", "videoDigital", "videoHardcopy");
program.setPossibleValues("resultDimension1", "column", "crossTrack", "line", "row",
"sample", "time","track", "vertical");
program.setPossibleValues("resultDimension2", "column", "crossTrack", "line", "row",
"sample", "time","track", "vertical");
program.setPossibleValues("roleCA_Detector", "resourceProvider", "custodian",
"owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_Detector1", "resourceProvider", "custodian",
"owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_Radiation", "resourceProvider", "custodian",
"owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_RadiometryInSensor", "resourceProvider",
"custodian", "owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_RadiometryInSensor1", "resourceProvider",
"custodian", "owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_RadiometryPreCorrection", "resourceProvider",
"custodian", "owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_SensorCharacteristics", "resourceProvider",
"custodian", "owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleCA_SensorCharacteristics1", "resourceProvider",
"custodian", "owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleMI_Instrument", "resourceProvider", "custodian",
"owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("roleSD_Calibration", "resourceProvider", "custodian",
"owner", "user", "distributor", "originator", "pointOfContact",
"principalInvestigator", "processor", "publisher", "author");
program.setPossibleValues("statusCA_Detector", "completed", "historicalArchive",
"obsolete", "onGoing", "planned", "required", "underDevelopment");
program.setPossibleValues("statusCA_RadiometryInSensor", "completed",
"historicalArchive", "obsolete", "onGoing", "planned", "required",
"underDevelopment");
program.setPossibleValues("statusCA_SensorCharacteristics", "completed",
"historicalArchive", "obsolete", "onGoing", "planned", "required",
"underDevelopment");
program.setPossibleValues("transferFunctionType", "linear", "logarithmic",
"exponential");
program.setPossibleValues("transmittedPolarization", "horizontal", "vertical",
"leftCircular", "rightCircular", "theta", "phi");

program.setPossibleValues("calibrationInstrument", "calibrationCage",
"controlPointArray", "goniometer", "multicollimator", "wallcorner", "other");
program.setPossibleValues("calibrationMethod", "integratingSphere", "flatField",
"macBethColourTarget","monoChromator", "calibratedLightSource", "other");
program.setPossibleValues("calibrationType", "laboratory", "testRange", "inSitu",
"inFlight", "vicarious", "cross", "other");
program.setPossibleValues("dataProductLevel", "rawData", "level0", "level1",
"level2", "level3", "level4", "other");
program.setPossibleValues("errorTypeCA_Documentation", "standardDeviation",
"rootMeanSquareErrorcoded", "other");
```

```
        program.setPossibleValues("errorTypeCA_PositionalError", "standardDeviation",
        "rootMeanSquareErrorcoded", "other");
        program.setPossibleValues("errorTypeCA_TestRange", "standardDeviation",
        "rootMeanSquareErrorcoded", "other");
        program.setPossibleValues("errorTypeDarkSignalNonUniformity", "standardDeviation",
        "rootMeanSquareErrorcoded", "other");
        program.setPossibleValues("method", "darkPixelSubtractionMethod",
        "semiEmpiricalBRDF", "radiativeTransferCode", "other");
        program.setPossibleValues("material", "awning", "concrete", "gravel", "other",
        "salt", "sand", "vegetation");
        program.setPossibleValues("materialCA_AirforcePattern", "awning", "concrete",
        "gravel", "other", "salt", "sand", "vegetation");
        program.setPossibleValues("materialCA_Siemensstar", "awning", "concrete", "gravel",
        "other", "salt", "sand", "vegetation");
        program.setPossibleValues("pointTypeCA_Documentation", "controlPoint", "checkPoint",
        "other");
        program.setPossibleValues("pointTypeCA_PositionalError", "controlPoint",
        "checkPoint", "other");
        program.setPossibleValues("pointTypeCA_TestRange", "controlPoint", "checkPoint",
        "other");
        program.setPossibleValues("pointSuspension", "cage", "tautline", "wall", "other");
        program.setPossibleValues("quantityTypeCA_Documentation", "minimum", "maximum",
        "mean", "other");
        program.setPossibleValues("quantityTypeCA_PositionalError", "minimum", "maximum",
        "mean", "other");
        program.setPossibleValues("quantityTypeCA_TestRange", "minimum", "maximum", "mean",
        "other");
        program.setPossibleValues("radiometricTransformation", "16To8Bit", "other");
        program.setPossibleValues("rotationSequenceCA_IMU", "XYZ", "XZY","YXZ", "YZX","ZXY",
        "ZYX");
        program.setPossibleValues("rotationSequenceCA_SensorSystem", "XYZ", "XZY","YXZ",
        "YZX","ZXY", "ZYX");
        program.setPossibleValues("rotationSequenceSD_AngleAttitude", "XYZ", "XZY","YXZ",
        "YZX","ZXY", "ZYX");
        program.setPossibleValues("samplingPattern", "square", "rectangular", "other");
        program.setPossibleValues("selfCalibrationModel", "brown", "fraser", "smac",
        "ebner", "jacobsen", "other");
        program.setPossibleValues("shapeCA_2DReflectanceTarget", "square", "rectangular",
        "irregular", "other");
        program.setPossibleValues("shapeCA_PointSpreadFunction", "square", "rectangular",
        "irregular", "other");
        program.setPossibleValues("shapeCA_PointSpreadFunctionCA_SensorParameters",
        "square", "rectangular", "irregular", "other");
        program.setPossibleValues("solarIrradiance", "smith_and_gottlieb_1974",
        "nickel_labs_1984", "wehrli_1985", "kurucz_1995", "thuillier_1996",
        "thuillier_2001", "kurucz_2005", "world_radiation_center",
        "solar_diffuser_panel","other");
        program.setPossibleValues("targetEnvironment", "homogeneous", "inhomogeneous",
        "other");
        program.setPossibleValues("tonalAdjustmentType", "gammaCorrection", "other");
        program.setPossibleValues("typeCA_AirforcePattern", "airforcePattern", "coded",
        "coded airforcePattern", "siemensStar", "swissSpiral", "other");
        program.setPossibleValues("typeCA_GeometricTarget", "airforcePattern", "coded",
        "coded airforcePattern", "siemensStar", "swissSpiral", "other");
        program.setPossibleValues("typeCA_Siemensstar", "airforcePattern", "coded", "coded
        airforcePattern", "siemensStar", "swissSpiral", "other");
        program.setPossibleValues("validationMethod", "testfield", "crossStripFlight",
        "secondFlight", "secondAltitude", "measurementActualParameters", "other");

        program.setMultipleValues(

                "bibliography",
                "columnCameraHead1",
                "columnCameraHead2",
                "columnCameraHead3",
                "columnCameraHead4",
                "columnPAN",
```

```
                "grayvalueCameraHeadIntermediate",
                "grayvalueCameraHeadRaw",
                "imageBrightnessAfterNormalizationCameraHead",
                "imageBrightnessBeforeNormalizationCameraHead",
                "lightCameraHeadIntermediate",
                "lightCameraHeadRaw",
                "modulationTransferFunctionCameraHead1",
                "modulationTransferFunctionCameraHead2",
                "modulationTransferFunctionCameraHead3",
                "modulationTransferFunctionCameraHead4",
                "modulationTransferFunctionPAN",
                "noiseCameraAfterNormalizationCameraHead",
                "noiseCameraBeforeNormalizationCameraHead",
                "radiusF2.8CameraHead1",
                "radiusF2.8CameraHead2",
                "radiusF2.8CameraHead3",
                "radiusF2.8CameraHead4",
                "radiusF4CameraHead1",
                "radiusF4CameraHead2",
                "radiusF4CameraHead3",
                "radiusF4CameraHead4",
                "radiusF5.6CameraHead1",
                "radiusF5.6CameraHead2",
                "radiusF5.6CameraHead3",
                "radiusF5.6CameraHead4",
                "radiusF5.6PAN",
                "radiusF8CameraHead1",
                "radiusF8CameraHead2",
                "radiusF8CameraHead3",
                "radiusF8CameraHead4",
                "radiusF8PAN",
                "radiusF11CameraHead1",
                "radiusF11CameraHead2",
                "radiusF11CameraHead3",
                "radiusF11CameraHead4",
                "radiusF11PAN",
                "radiusF16CameraHead1",
                "radiusF16CameraHead2",
                "radiusF16CameraHead3",
                "radiusF16CameraHead4",
                "radiusF16PAN",
                "radiusF22CameraHead1",
                "radiusF22CameraHead2",
                "radiusF22CameraHead3",
                "radiusF22CameraHead4",
                "radiusF22PAN",
                "radiusF32PAN",
                "relativeGrayvalueF2.8CameraHead1",
                "relativeGrayvalueF2.8CameraHead2",
                "relativeGrayvalueF2.8CameraHead3",
                "relativeGrayvalueF2.8CameraHead4",
                "relativeGrayvalueF4CameraHead1",
                "relativeGrayvalueF4CameraHead2",
                "relativeGrayvalueF4CameraHead3",
                "relativeGrayvalueF4CameraHead4",
                "relativeGrayvalueF5.6CameraHead1",
                "relativeGrayvalueF5.6CameraHead2",
                "relativeGrayvalueF5.6CameraHead3",
                "relativeGrayvalueF5.6CameraHead4",
                "relativeGrayvalueF5.6PAN",
                "relativeGrayvalueF8CameraHead1",
                "relativeGrayvalueF8CameraHead2",
                "relativeGrayvalueF8CameraHead3",
                "relativeGrayvalueF8CameraHead4",
                "relativeGrayvalueF8PAN",
                "relativeGrayvalueF11CameraHead1",
                "relativeGrayvalueF11CameraHead2",
```

```
                "relativeGrayvalueF11CameraHead3",
                "relativeGrayvalueF11CameraHead4",
                "relativeGrayvalueF11PAN",
                "relativeGrayvalueF16CameraHead1",
                "relativeGrayvalueF16CameraHead2",
                "relativeGrayvalueF16CameraHead3",
                "relativeGrayvalueF16CameraHead4",
                "relativeGrayvalueF16PAN",
                "relativeGrayvalueF22CameraHead1",
                "relativeGrayvalueF22CameraHead2",
                "relativeGrayvalueF22CameraHead3",
                "relativeGrayvalueF22CameraHead4",
                "relativeGrayvalueF22PAN",
                "relativeGrayvalueF32PAN",
                "relativeSpectralResponseCameraHead1",
                "relativeSpectralResponseCameraHead2",
                "relativeSpectralResponseCameraHead3",
                "relativeSpectralResponseCameraHead4",
                "relativeSpectralResponsePAN",
                "rowCameraHead1",
                "rowCameraHead2",
                "rowCameraHead3",
                "rowCameraHead4",
                "rowPAN",
                "signalToNoiseRatioCalPAN",
                "signalToNoiseRatioNoCalPAN",
                "spectrometerMeasuredRadianceCalPAN",
                "spectrometerMeasuredRadianceNoCalPAN",
                "temperatureForMTFCameraHead1",
                "temperatureForMTFCameraHead2",
                "temperatureForMTFCameraHead3",
                "temperatureForMTFCameraHead4",
                "temperatureForMTFPAN",
                "wavelengthCameraHead1",
                "wavelengthCameraHead2",
                "wavelengthCameraHead3",
                "wavelengthCameraHead4",
                "wavelengthPAN",

                "alternateTitleCA_Detector",
                "alternateTitleCA_Radiation",
                "alternateTitleCA_RadiometryInSensor",
                "alternateTitleCA_RadiometryPreCorrection",
                "alternateTitleCA_SensorCharacteristics",
                "alternateTitleMI_Instrument",
                "creditCA_Detector",
                "creditCA_RadiometryInSensor",
                "creditCA_SensorCharacteristics",
                "presentationFormCA_Detector",
                "presentationFormCA_Radiation",
                "presentationFormCA_RadiometryInSensor",
                "presentationFormCA_RadiometryPreCorrection",
                "presentationFormCA_SensorCharacteristics",
                "presentationFormMI_Instrument",
                "statusCA_Detector",
                "statusCA_RadiometryInSensor",
                "statusCA_SensorCharacteristics",

                "acrossStripOverlap",
                "alongStripOverlap",
                "b",
                "base",
                "c",
                "geometryCalibrationDate",
                "geometryCalibrationType",
                "checkPoint",
                "controlPointCA_RadiometryTestRange",
```

```
                "controlPointCA_TestRange",
                "distortionValues",
                "flyingHeight",
                "flyingAltitudeAboveGround",
                "gain",
                "geometryCalibrationDate",
                "geometryCalibrationType",
                "in",
                "k",
                "maxWavelength",
                "minWavelength",
                "modulationTransferFunction",
                "modulationTransferFunctionAcross",
                "modulationTransferFunctionAlong",
                "offset",
                "out",
                "parametersCA_GeometricPreCorrection",
                "parametersCA_RadiometryPreCorrection",
                "photoScale",
                "polynomialCoefficients",
                "positionInImage",
                "receivedIntensity",
                "recordedIntensity",
                "response",
                "responseCA_2DReflectanceTarget",
                "responseCA_OpticalFilters",
                "responseCA_SensorParameters",
                "signOfGain",
                "validationMethod",
                "wavelengthCA_Spectrum",
                "wavelengthCA_SpectrumCA_2DReflectanceTarget",
                "wavelengthCA_SpectrumCA_OpticalFilters",
                "wavelengthCA_SpectrumCA_SensorParameters"
        );
    }

    private static final Program program = new Program();
}
```

Anhang D
Die Quelltextdatei des Softwareprogramms: Program.java

```
package report_generator;

import com.itextpdf.text.DocumentException;
import com.itextpdf.text.PageSize;
import com.itextpdf.text.Rectangle;
import com.itextpdf.text.pdf.PdfWriter;
import java.awt.Desktop;
import java.io.File;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.StringReader;
import java.text.DateFormat;
import java.text.ParseException;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.LinkedHashMap;
import java.util.Map;
import java.util.Scanner;
import java.util.Stack;
import javax.xml.parsers.*;
import javax.xml.transform.OutputKeys;
import javax.xml.transform.Transformer;
import javax.xml.transform.TransformerConfigurationException;
import javax.xml.transform.TransformerException;
import javax.xml.transform.TransformerFactory;
import javax.xml.transform.dom.DOMSource;
import javax.xml.transform.stream.StreamResult;
import org.w3c.dom.*;
import org.xml.sax.InputSource;
import org.xml.sax.SAXException;

public class Program {
    private ArrayList<Parameter> _parameters;
    private String _inputPath;
    private String _typesPath;
    private String _othersPath;
    private String _outputPath;
    private final Map<String, String> _paramTypeMap = new LinkedHashMap<>();
    private final Stack<Parameter> _parametersStack = new Stack<>();
    private final DocumentBuilderFactory dbFactory = DocumentBuilderFactory.newInstance();
    private DocumentBuilder dBuilder = null;

    public void setInputXmlPath(String path) {
        _inputPath = path;
    }

    public void setTypesXmlPath(String path) {
        _checkFile(path, true);
        _typesPath = path;
    }

    public void setOthersXmlPath(String path) {
        _checkFile(path, true);
        _othersPath = path;
    }

    public void setOutputPdfPath(String path) {
        _checkFile(path, false);
        _outputPath = path;
    }

    public void initParameters() {
        _parameters = new ArrayList<>();
        _loadParameterTypes();
```

```
        _loadOtherParameters();
         try {
            _loadMainParameters();
        }
        catch (Exception e) {
            System.out.println(e.getLocalizedMessage());
            System.exit(1);
        }
    }

    public void setPossibleValues(String parameterName, Object... possibleValues) {
        Parameter parameter = _getParameterOfName(parameterName);
        for (Object value : possibleValues) {
            parameter.addPossibleValue(value);
        }
    }

    public void setMultipleValues(String... parameterNames) {
        for (String parameterName : parameterNames) {
            setMultipleValues(parameterName);
        }
    }

    public void setMultipleValues(String parameterName) {
        _getParameterOfName(parameterName).setAllowInfiniteValuesCount(true);
    }

    public String getFirstValueOfParameter(String parameterName) {
        return getValuesOfParameter(parameterName).get(0).toString();
    }

    public ArrayList<Object> getValuesOfParameter(String parameterName) {
        Parameter parameter = _getParameterOfName(parameterName);

        if (parameter == null) {
            return new ArrayList<>(Arrays.asList("*** Lack of request parameter <" +
            parameterName + "> ***"));
        }

        ArrayList<Object> values = parameter.getValues();

        if (values.isEmpty()) {
            values.add(parameter.getDefaultValue());
        }

        return values;
    }

    public String getValuesOfParameterAsString(String parameterName, int maxValues, String
    separator) {
         ArrayList<Object> valuesList = getValuesOfParameter(parameterName);

        String result = "";
        int currentParameter = 0;

        for (Object value : valuesList) {
            result += value.toString() + separator;
            ++currentParameter;

            if (currentParameter >= maxValues) {
                break;
            }
        }

        return result.substring(0, result.length() - separator.length());
    }
```

```
    public void getValuesFromUser() {
        _printPossibleParameters();

        Scanner scanner = new Scanner(System.in);
        String value = "";

        while (!value.equals("e")) {
            value = scanner.nextLine();

            if (value.equals("g")) {
                _generateReport();
                _pressEnterKey();
            }
            else {
                try {
                    int id = Integer.parseInt(value);

                    _parametersStack.add(_getParameterOfId(id));
                    _processCurrentParameter();
                } catch (NumberFormatException e) {
                    if (!value.equals("e")) {
                        System.out.println("Improper value was given.");
                    }
                    else {
                        break;
                    }
                }
            }

            _printPossibleParameters();
        }
    }

    private void _pressEnterKey() {
        System.out.println("Press enter to continue.");

        try {
            System.in.read();
        } catch (IOException ex) {
        }
    }

    private void _checkFile(String path, boolean read) {
        File tmp = new File(path);

        if (read) {
            if (!tmp.canRead()) {
                System.out.println("Can't read from the source file.  " + path + ".");
                System.exit(1);
            }
        } else {
            try {
                tmp.createNewFile();
                if (!tmp.canWrite()) {
                    throw new IOException();
                }
            } catch (IOException ex) {
                System.out.println("Unable to write to Report.pdf. " + path + ".");
                System.exit(1);
            }
        }
    }

    private void _generateReport() {
        try {
            com.itextpdf.text.Document pdfDocument = new com.itextpdf.text.Document(new
            Rectangle(PageSize.A4));
```

```
            PdfWriter.getInstance(pdfDocument, new FileOutputStream(_outputPath));

            pdfDocument.open();

            PageGenerator generator = new PageGenerator(this, pdfDocument);

            generator.generateReport();

            pdfDocument.close();

            Desktop.getDesktop().open(new File(_outputPath));
            System.out.println("Report was generated to a file " + _outputPath + ".");
    }
      catch (DocumentException | IOException ex) {
            System.out.println("An error occurred while generating the report " +
            _outputPath + ". Powod: " + ex.getLocalizedMessage());
        }
    }

    private String _formatParameter(Parameter parameter) {
        String value = "";
        boolean defaultValue = false;

        if (parameter.getValues().isEmpty()) {
            value = parameter.getDefaultValue().toString();
            defaultValue = true;
        } else {
            for (Object v : parameter.getValues()) {
                value += v.toString() + "; ";
            }
        }

        return String.format("[%d] %s [%s]", parameter.getId(), parameter.getName(),
        (value.length() > 2 && !defaultValue) ? value.substring(0, value.length() - 2) :
        value);
    }

    private void _printPossibleParameters() {
        for (int i = 0; i < _parameters.size(); ++i) {
            Parameter parameter = _parameters.get(i);

            if (!parameter.getParents().isEmpty()) {
                continue;
            }

            System.out.println(_formatParameter(parameter));
        }

        System.out.println("[e] EXIT");
        System.out.println("[g] Generate a report PDF");
        _printHierarchyPosition();
    }

    private ArrayList<Parameter> _getChildParameters(Parameter parameter) {
        ArrayList<Parameter> list = new ArrayList<>();

        for (Parameter p : _parameters) {
            if (p.getParents().contains(parameter)) {
                list.add(p);
            }
        }

        return list;
    }

    private Parameter _getParameterOfId(int id) {
```

```
        if (id > Parameter.getLastId()) {
            throw new NullPointerException(String.valueOf(id));
        }

        for (Parameter parameter : _parameters) {
            if (parameter.getId() == id) {
                return parameter;
            }
        }

        return null;
    }

    private Parameter _getParameterOfName(String name) {
        for (Parameter parameter : _parameters) {
            if (parameter.getName().equals(name)) {
                return parameter;
            }
        }

        return null;
    }

    private void _printHierarchyPosition() {
        System.out.print("Currently it is in: ");
        System.out.print("[root");
        for (int i = 0; i < _parametersStack.size(); ++i) {
            System.out.print("->" + _parametersStack.get(i).getName());
        }
        System.out.println("]");
    }

    private void _processCurrentParameter() {
        if (!_parametersStack.isEmpty()) {
            Scanner scanner = new Scanner(System.in);
            String newValue;

            Parameter parameterToModify = _parametersStack.peek();

            if (parameterToModify.isContainer()) {
                _printHierarchyPosition();

                for (Parameter childParameter : _getChildParameters(parameterToModify)) {
                    System.out.println(_formatParameter(childParameter));
                }

                System.out.println("[e] Backwards");

                newValue = scanner.nextLine();

                if (newValue.equals("e")) {
                    _parametersStack.pop();

                    if (!_parametersStack.isEmpty()) {
                        _processCurrentParameter();
                    }
                    else {
                        return;
                    }
                }
                else {
                    try {
                        Parameter childParameter =
                        _getParameterOfId(Integer.parseInt(newValue));

                        if (childParameter.getParents().contains(parameterToModify)) {
                            _parametersStack.add(childParameter);
```

```
                    _processCurrentParameter();

                    return;
                }
                else {
                    System.out.println("ID is incorrect.");
                    _processCurrentParameter();

                    return;
                }
            } catch (Exception e) {
                System.out.println("ID is incorrect.");
                _processCurrentParameter();

                return;
            }
        }
    }
    else if (parameterToModify.getPossibleValues() != null) {
        System.out.println("Possible values:");

        for (Object possibleValue : parameterToModify.getPossibleValues()) {
            System.out.println(possibleValue);
        }

        newValue = scanner.nextLine();

        if (parameterToModify.getPossibleValues().contains(newValue)) {
            if (parameterToModify.areMultipleValuesAllowed()) {
                _processMultipleValuesParameter(parameterToModify, newValue);
            }
            else {
                _processSingleValueParameter(parameterToModify, newValue);
            }
            _parametersStack.pop();
        }
        else {
            System.out.println("Value is incorrect.");
            _processCurrentParameter();

            return;
        }
    }
    else {
        System.out.println("Expected type: " + parameterToModify.getType().getName());

        newValue = scanner.nextLine();

        try {
            switch (parameterToModify.getType()) {
                case INT:
                    Integer.parseInt(newValue);
                    break;
                case DOUBLE:
                    Double.parseDouble(newValue);
                    break;
                case DATE:
                    DateFormat dateFormat = DateFormat.getDateInstance();
                    dateFormat.parse(newValue);
                    break;
                case BOOLEAN:
                        Boolean.parseBoolean(newValue);
                        break;
                case STRING:
                case UNKNOWN:
                    break;
            }
```

```
                }
                catch (NumberFormatException | ParseException e) {
                    System.out.println("Input value has improper type.");
                    _processCurrentParameter();

                    return;
                }
            }

            if (parameterToModify.areMultipleValuesAllowed()) {
                _processMultipleValuesParameter(parameterToModify, newValue);
            }
            else {
                _processSingleValueParameter(parameterToModify, newValue);
            }

            if (!_parametersStack.isEmpty()) {
                _parametersStack.pop();
                _processCurrentParameter();
            }
        }
    }

    private void _processSingleValueParameter(Parameter parameterToModify, Object newValue) {
        if (parameterToModify.getValues().isEmpty()) {
            parameterToModify.addValue(newValue);
        }
        else {
            parameterToModify.setValue(0, newValue);
        }
    }

    private void _processMultipleValuesParameter(Parameter parameterToModify, Object
    newValue) {

        Scanner scanner = new Scanner(System.in);
        ArrayList<Object> values = parameterToModify.getValues();

        while (true) {
            String choice = "n";

            if (!values.isEmpty())
            {

                System.out.println("[n] -sdd the value as a new");
                System.out.println("Change the existing value:");
                for (int i = 0; i < values.size(); ++i) {
                    System.out.println("[" + i + "] " + values.get(i).toString());
                }
                choice = scanner.nextLine();
            }

            if (choice.equals("n")) {
                parameterToModify.addValue(newValue);
                return;
            }
            else {
                try {
                    int index = Integer.parseInt(choice);

                    if (index >= parameterToModify.getValues().size()) {
                        throw new IndexOutOfBoundsException(choice);
                    }
                    else {
                        parameterToModify.setValue(index, newValue);
                        return;
                    }
```

```
            } catch (NumberFormatException | IndexOutOfBoundsException exc) {
                System.out.println(exc.getLocalizedMessage());
            }
        }
    }
}

private Document getDocument(String path) throws ParserConfigurationException,
SAXException, IOException {
    dBuilder = dbFactory.newDocumentBuilder();
    Document doc = dBuilder.parse(new File(path));
    doc.normalize();
    return doc;
}

private ParameterType _getParameterType(String parameterName) {
    String type = _paramTypeMap.get(parameterName);

    if (type == null) {
        throw new NullPointerException(parameterName + " - the type of parameter does
        not exist in the file Types!");
    }

    switch (type) {
        case "string": return ParameterType.STRING;
        case "integer": return ParameterType.INT;
        case "double": return ParameterType.DOUBLE;
        case "date": return ParameterType.DATE;
        case "boolean": return ParameterType.BOOLEAN;
        default: return ParameterType.UNKNOWN;
    }
}

private void _loadParameterTypes() {
    try {
        Document typesDocument = getDocument(_typesPath);

        NodeList typeNodeList = typesDocument.getElementsByTagName("type");

        for (int i = 0; i < typeNodeList.getLength(); ++i) {
            Node currentNode = typeNodeList.item(i);

            if (currentNode.getNodeType() == Node.ELEMENT_NODE) {
                Element currentElement = (Element)currentNode;

                String name =
                currentElement.getElementsByTagName("name").item(0).getTextContent();

                NodeList elementsList = currentElement.getElementsByTagName("parameter");

                for (int j = 0; j < elementsList.getLength(); ++j) {
                    _paramTypeMap.put(elementsList.item(j).getTextContent(), name);
                }
            }
        }
    }
    catch (ParserConfigurationException | SAXException | IOException e) {
        System.out.println(e.getLocalizedMessage());
    }
}

private void _loadOtherParameters() {
    try {
        Document othersDocument = getDocument(_othersPath);

        NodeList nodeList = othersDocument.getElementsByTagName("others");
```

```
            NodeList childrenList = nodeList.item(0).getChildNodes();

            for (int i = 0; i < childrenList.getLength(); ++i) {
                Node currentNode = childrenList.item(i);
                if (currentNode.getNodeType() == Node.ELEMENT_NODE) {
                    Element currentElement = (Element)currentNode;
                    _parameters.add(new Parameter(currentElement.getTagName(),
                    _getParameterType(currentElement.getTagName()),
                    currentElement.getTextContent()));
                }
            }
        }
        catch (ParserConfigurationException | SAXException | IOException e) {
            System.out.println(e.getLocalizedMessage());
        }
    }

    private void _loadMainParameters() throws TransformerConfigurationException,
    TransformerException {
        try {
            Document inputDocument;

            if (!(new File(_inputPath)).exists()) {
                DocumentBuilderFactory documentBuilderFactory =
                DocumentBuilderFactory.newInstance();
                DocumentBuilder documentBuilder = documentBuilderFactory.newDocumentBuilder();
                inputDocument = documentBuilder.parse(new InputSource(new
                StringReader(FileContents.getMainFileContent())));

                TransformerFactory transformerFactory =
                TransformerFactory.newInstance();
                Transformer transformer = transformerFactory.newTransformer();
                transformer.setOutputProperty(OutputKeys.INDENT, "yes");

                transformer.transform(new DOMSource(inputDocument.getFirstChild()), new
                StreamResult(new File(_inputPath)));
            }

            inputDocument = getDocument(_inputPath);

            NodeList nodeList = inputDocument.getElementsByTagName("Norm");
            NodeList childrenList = nodeList.item(0).getChildNodes();

            for (int i = 0; i < childrenList.getLength(); ++i) {
                Node currentNode = childrenList.item(i);
                if (currentNode.getNodeType() == Node.ELEMENT_NODE) {
                    Element currentElement = (Element)currentNode;
                    _loadMainParametersRecursive(null, currentElement);
                }
            }
        }
        catch (ParserConfigurationException | SAXException | IOException e) {
            System.out.println(e.getLocalizedMessage());
        }
    }

    private void _loadMainParametersRecursive(Parameter parent, Element element) {
        Parameter currentParameter = _getParameterOfName(element.getTagName());

        if (currentParameter == null) {
            currentParameter = new Parameter(element.getTagName(), ParameterType.UNKNOWN,
            element.getTextContent());
            _parameters.add(currentParameter);
        }

        if (parent != null) {
            currentParameter.addParentParameter(parent);
```

```
        }

        if (element.hasChildNodes()) {
            NodeList childNodes = element.getChildNodes();

            for (int j = 0; j < childNodes.getLength(); ++j) {
                Node currentChildNode = childNodes.item(j);

                if (currentChildNode.getNodeType() == Node.ELEMENT_NODE) {
                    if (!currentParameter.isContainer()) {
                        currentParameter.setContainer(true);
                        currentParameter.setDefaultValue("Expand...");
                    }

                    _loadMainParametersRecursive(currentParameter, (Element)currentChildNode);
                }
            }
        }

        if (!currentParameter.isContainer()) {
            currentParameter.setType(_getParameterType(element.getTagName()));
        }
    }
}
```

Anhang D
Die Quelltextdatei des Softwareprogramms: Parameter.java

```
package report_generator;

import java.util.ArrayList;

public class Parameter {

    public Parameter(String name, ParameterType type, Object defaultValue) {
        _id = _nextId;
        ++_nextId;

        _name = name;
        _type = type;
        _defaultValue = defaultValue;
    }

    public int getId() {
        return _id;
    }

    public static int getLastId() {
        return _nextId - 1;
    }

    public Object getDefaultValue() {
        return _defaultValue;
    }

    public String getName() {
        return _name;
    }

    public ArrayList<Object> getPossibleValues() {
        return _possibleValues;
    }

    public ParameterType getType() {
        return _type;
    }

    public ArrayList<Object> getValues() {
        return _values;
    }

    public ArrayList<Parameter> getParents() {
        return _parentsList;
    }

    public boolean isContainer() {
        return _container;
    }

    public boolean areMultipleValuesAllowed() {
        return _allowInfiniteValuesCount;
    }

    public void setDefaultValue(Object defaultValue) {
        _defaultValue = defaultValue;
    }

    public void setName(String name) {
        _name = name;
    }

    public void setPossibleValues(ArrayList<Object> possibleValues) {
```

```
        _possibleValues = possibleValues;
    }

    public void setType(ParameterType type) {
        _type = type;
    }

    public void setValue(int index, Object newValue) {
        _values.set(index, newValue);
    }

    public void addValue(Object value) {
        _values.add(value);
    }

    public void setAllowInfiniteValuesCount(boolean allow) {
        _allowInfiniteValuesCount = allow;
    }

    public void addParentParameter(Parameter parent) {
        _parentsList.add(parent);
    }

    public void setContainer(boolean container) {
        _container = container;
    }

    public void addPossibleValue(Object value) {
        if (_possibleValues == null) {
            _possibleValues = new ArrayList<>();
        }

        _possibleValues.add(value);
    }

    private final int _id;
    private static int _nextId = 1;
    private String _name;
    private ArrayList<Object> _possibleValues = null;
    private ParameterType _type;
    private final ArrayList<Object> _values = new ArrayList<>();
    private Object _defaultValue;
    private boolean _allowInfiniteValuesCount = false;
    private final ArrayList<Parameter> _parentsList = new ArrayList<>();
    private boolean _container = false;
}
```

Anhang D
Die Quelltextdatei des Softwareprogramms: ParameterType.java

```
package report_generator;

public enum ParameterType {
    INT("Int"), DOUBLE("Double"), STRING("String"), DATE("Date"), BOOLEAN("Boolean"),
    UNKNOWN("???");

    public String getName() {
        return _name;
    }

    private ParameterType(String name) {
        _name = name;
    }

    private final String _name;
}
```

Anhang D
Die Quelltextdatei des Softwareprogramms: Pair.java

```
package report_generator;

public class Pair<X, Y> {

    public Pair(X key, Y value) {
        _key = key;
        _value = value;
    }

    public void setKey(X key) {
        _key = key;
    }

    public void setValue(Y value) {
        _value = value;
    }

    public X getKey() {
        return _key;
    }

    public Y getValue() {
        return _value;
    }

    private X _key;
    private Y _value;

}
```

Anhang D
Die Quelltextdatei des Softwareprogramms: PageGenerator.java

```
package report_generator;

import com.itextpdf.text.Chunk;
import com.itextpdf.text.DocumentException;
import com.itextpdf.text.Font;
import com.itextpdf.text.FontFactory;
import com.itextpdf.text.Paragraph;
import com.itextpdf.text.Phrase;
import com.itextpdf.text.pdf.BaseFont;
import com.itextpdf.text.pdf.PdfPCell;
import com.itextpdf.text.pdf.PdfPTable;
import com.itextpdf.text.pdf.draw.LineSeparator;
import java.util.ArrayList;

public class PageGenerator {
    public PageGenerator(Program programObject, com.itextpdf.text.Document pdfDocument) {
        _programObject = programObject;

        _pdfDocument = pdfDocument;

        _font20 = FontFactory.getFont(_font, _encoding, 20.0f);
        _font20bold = FontFactory.getFont(_boldFont, _encoding, 20.0f);
        _font16 = FontFactory.getFont(_font, _encoding, 16.0f);
        _font16bold = FontFactory.getFont(_boldFont, _encoding, 16.0f);
        _font14 = FontFactory.getFont(_font, _encoding, 14.0f);
        _font14bold = FontFactory.getFont(_boldFont, _encoding, 14.0f);
        _font13 = FontFactory.getFont(_font, _encoding, 13.0f);
    }

    public void generateReport() throws DocumentException {
        _page1();
        _page2();
        _page3();
        _page4();
        _page5();
        _page6();
        _page7();
        _page8();
        _page9();
        _page10();
        _page11();
        _page12();
        _page15();
        _page16();
        _page17();
        _page18();
        _page19();
        _page20();
        _page21();
        _page22();
        _page23();
        _page24();
        _page25();
        _page26();
        _page27();
        _page28();
        _page29();
        _page30();
        _page31();
        _page32();
        _page33();
        _page34();
        _page35();
        _page36();
```

```
        _page37();
        _page38();
        _page39();
        _page40();
        _page41();
    }

    private PdfPCell _createCell(String text, boolean getValueFromProgram, int colSpan,
    boolean border) {
        PdfPCell cell = new PdfPCell(new Phrase(getValueFromProgram ?
        _programObject.getFirstValueOfParameter(text) : text, _font14));
        _setBorder(cell, border);
        cell.setColspan(colSpan);
        return cell;
    }

    private Pair<PdfPCell, PdfPCell> _createPair(String name, String value) {
        return new Pair<PdfPCell, PdfPCell>(
            _createCell(name, false, 1, false),
            _createCell(value, true, 1, false)
        );
    }

    private void _setBorder(PdfPCell cell, boolean on) {
        if (!on) {
            cell.setBorder(PdfPCell.NO_BORDER);
        }
        else {
            cell.setBorder(PdfPCell.TOP | PdfPCell.BOTTOM | PdfPCell.LEFT | PdfPCell.RIGHT);
        }
    }

    private PdfPTable _generatePairListTable(ArrayList<Pair<PdfPCell, PdfPCell>> pairList,
    boolean border, float widthPercentage, int horizontalAlignment) throws DocumentException {

        PdfPTable paramsTable = new PdfPTable(2);

        paramsTable.setHorizontalAlignment(horizontalAlignment);

        paramsTable.setWidthPercentage(widthPercentage);

        for (Pair<PdfPCell, PdfPCell> pair : pairList) {
            _setBorder(pair.getKey(), border);

            paramsTable.addCell(pair.getKey());

            if (pair.getValue() != null) {
                _setBorder(pair.getValue(), border);

                paramsTable.addCell(pair.getValue());
            }
        }

        return paramsTable;
    }

    private void _page41() throws DocumentException {
        _pdfDocument.add(new Paragraph("Bibliography", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getValuesOfParameterAsString("bibliography", 15, "\n"),
        _font13));

        _pdfDocument.newPage();
    }

    private void _page40() throws DocumentException {
```

```
_pdfDocument.add(new Paragraph("Defect Pixel Recognition", _font20));
_pdfDocument.add(Chunk.NEWLINE);
_pdfDocument.add(new Paragraph("The table below shows the maximal allowed physical
defects on the CCD Sensor and its definitions.", _font14));

PdfPTable table = new PdfPTable(3);
table.setSpacingBefore(20.0f);
table.addCell(_createCell("Description", false, 2, true));
table.addCell(_createCell("CCD Spec", false, 1, true));
PdfPCell pixelCell = _createCell("Pixel", false, 1, true);
pixelCell.setRowspan(4);
table.addCell(pixelCell);
table.addCell(_createCell("Bright image", false, 1, true));

table.addCell(_createCell(_programObject.getFirstValueOfParameter("descriptionOfBright
Image"), false, 1, true));
table.addCell(_createCell("Dark image", false, 1, true));

table.addCell(_createCell(_programObject.getFirstValueOfParameter("descriptionOfDarkIm
age"), false, 1, true));
table.addCell(_createCell("Max Count PAN", false, 1, true));
table.addCell(_createCell("maximumAllowedDefectPixelsPAN", true, 1, true));
table.addCell(_createCell("Max Count MS", false, 1, true));
table.addCell(_createCell("maximumAllowedDefectPixelsCameraHead", true, 1, true));

PdfPTable table1 = new PdfPTable(3);
table1.setSpacingBefore(20.0f);
table1.addCell(_createCell("Description", false, 2, true));
table1.addCell(_createCell("CCD Spec", false, 1, true));
PdfPCell pixelCell1 = _createCell("Column", false, 1, true);
pixelCell1.setRowspan(6);
table1.addCell(pixelCell1);
table1.addCell(_createCell("Definition", false, 1, true));

table1.addCell(_createCell(_programObject.getFirstValueOfParameter("definitionOfColumn
Defects"), false, 1, true));
table1.addCell(_createCell("Recognition (bright and dark)", false, 1, true));
table1.addCell(_createCell(_programObject.getFirstValueOfParameter("recognition"),
false, 1, true));
table1.addCell(_createCell("Max single column PAN", false, 1, true));
table1.addCell(_createCell("maxSingleColumnPAN", true, 1, true));
table1.addCell(_createCell("Max single column MS", false, 1, true));
table1.addCell(_createCell("maxSingleColumnCameraHead", true, 1, true));
table1.addCell(_createCell("Max double column PAN", false, 1, true));
table1.addCell(_createCell("maxDoubleColumnPAN", true, 1, true));
table1.addCell(_createCell("Max double column MS", false, 1, true));
table1.addCell(_createCell("maxDoubleColumnCameraHead", true, 1, true));

PdfPTable table2 = new PdfPTable(2);
table2.setSpacingBefore(20.0f);
table2.addCell(_createCell("PPS Correction", false, 2, true));
PdfPCell pixelCell2 = _createCell("Pixel", false, 1, true);
pixelCell2.setRowspan(2);
table2.addCell(pixelCell2);

table2.addCell(_createCell(_programObject.getFirstValueOfParameter("descriptionOfPPSCo
rrectionPixel"), false, 1, true));

PdfPTable table3 = new PdfPTable(2);
table3.setSpacingBefore(20.0f);
table3.addCell(_createCell("PPS Correction", false, 2, true));
PdfPCell pixelCell3 = _createCell("Column", false, 1, true);
pixelCell3.setRowspan(2);
table3.addCell(pixelCell3);

table3.addCell(_createCell(_programObject.getFirstValueOfParameter("descriptionOfPPSCo
rrectionColumn"), false, 1, true));
```

```
        _pdfDocument.add(table);
        _pdfDocument.add(table1);
        _pdfDocument.add(new Paragraph("The Post-Processing-Software is correcting following
        pixel and columns:", _font14));
        _pdfDocument.add(table2);
        _pdfDocument.add(table3);

        _pdfDocument.newPage();
    }

    private void _page39() throws DocumentException {
        _pdfDocument.add(new Paragraph("Sensor Geometric Accuracy", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfSensorGeometricAccurac
        y"), _font14));

        _pdfDocument.newPage();
    }

    private void _page38() throws DocumentException {
          _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Defect Pixel", _font16));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new
          Paragraph(_programObject.getFirstValueOfParameter("cameraHead1")+ " ("+
          _programObject.getFirstValueOfParameter("serialNumberCameraHead1") + ")" ,
          _font16));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Defect pixels are detected during radiometric
          calibration and will be corrected during radiometric processing of the images. The
          quantity and cumulative percentage and specification of defects is described in
          Appendix “Defect Pixel Recognition”.", _font14));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Revision of calibration:
          "+_programObject.getFirstValueOfParameter("revisionOfCalibration"), _font14));
          _pdfDocument.add(new Paragraph("CCDRevision:
          "+_programObject.getFirstValueOfParameter("ccdRevision"), _font14));
          _pdfDocument.add(new Paragraph("Date Number:
          "+_programObject.getFirstValueOfParameter("dataNumberCameraHead1"), _font14));
          _pdfDocument.add(new Paragraph("Date:
          "+_programObject.getFirstValueOfParameter("dateDefectPixel"), _font14));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Number of defect pixels:
          "+_programObject.getFirstValueOfParameter("numberOfDefectPixelsCameraHead1"),
          _font14));
          _pdfDocument.add(new Paragraph("Number of defect clusters:
          "+_programObject.getFirstValueOfParameter("numberOfDefectClustersCameraHead1"),
          _font14));
          _pdfDocument.add(new Paragraph("Number of defect columns:
          "+_programObject.getFirstValueOfParameter("numberOfDefectColumnsCameraHead1"),
          _font14));

          PdfPTable parametersTable = new PdfPTable(2);
          parametersTable.setSpacingBefore(20.0f);
          parametersTable.addCell(_createCell("Row", false, 1, true));
          parametersTable.addCell(_createCell("Column", false, 1, true));
          Object value = _programObject.getValuesOfParameterAsString("rowCameraHead1", 200,
          "\n");
          parametersTable.addCell(_createCell(value.toString(), false, 1, false));
          Object value1 = _programObject.getValuesOfParameterAsString("columnCameraHead1",
          200, "\n");
          parametersTable.addCell(_createCell(value1.toString(), false, 1, false));

          _pdfDocument.add(parametersTable);
```

```
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page37() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Aperture Correction", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHead1")+ " ("+
        _programObject.getFirstValueOfParameter("serialNumberCameraHead1") + ")" , _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("lightFalloff"), _font14));
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("figureLightFallOff"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHead1") + " " +
        _programObject.getFirstValueOfParameter("cameraName"), _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Grayvalue (Normalized to max) F11",
        false, 1, true));
        parametersTable.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF11CameraHead1", 10,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("radiusF11CameraHead1",
        10, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Relative Grayvalue (Normalized to max) F16",
        false, 1, true));
        parametersTable1.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF16CameraHead1", 10,
        "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 = _programObject.getValuesOfParameterAsString("radiusF16CameraHead1",
        10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        PdfPTable parametersTable2 = new PdfPTable(2);
        parametersTable2.setSpacingBefore(20.0f);
        parametersTable2.addCell(_createCell("Relative Grayvalue (Normalized to max) F22",
        false, 1, true));
        parametersTable2.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value4 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF22CameraHead1", 10,
        "\n");
        parametersTable2.addCell(_createCell(value4.toString(), false, 1, true));
        Object value5 = _programObject.getValuesOfParameterAsString("radiusF22CameraHead1",
        10, "\n");
        parametersTable2.addCell(_createCell(value5.toString(), false, 1, true));

        PdfPTable parametersTable3 = new PdfPTable(2);
        parametersTable3.setSpacingBefore(20.0f);
        parametersTable3.addCell(_createCell("Relative Grayvalue (Normalized to max) F2.8",
        false, 1, true));
```

```
        parametersTable3.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value6 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF2.8CameraHead1", 10,
        "\n");
        parametersTable3.addCell(_createCell(value6.toString(), false, 1, true));
        Object value7 =
        _programObject.getValuesOfParameterAsString("radiusF2.8CameraHead1", 10, "\n");
        parametersTable3.addCell(_createCell(value7.toString(), false, 1, true));

        PdfPTable parametersTable4 = new PdfPTable(2);
        parametersTable4.setSpacingBefore(20.0f);
        parametersTable4.addCell(_createCell("Relative Grayvalue (Normalized to max) F4",
        false, 1, true));
        parametersTable4.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value8 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF4CameraHead1", 10,
        "\n");
        parametersTable4.addCell(_createCell(value8.toString(), false, 1, true));
        Object value9 = _programObject.getValuesOfParameterAsString("radiusF4CameraHead1",
        10, "\n");
        parametersTable4.addCell(_createCell(value9.toString(), false, 1, true));

        PdfPTable parametersTable5 = new PdfPTable(2);
        parametersTable5.setSpacingBefore(20.0f);
        parametersTable5.addCell(_createCell("Relative Grayvalue (Normalized to max) F5.6",
        false, 1, true));
        parametersTable5.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value10 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF5.6CameraHead1", 10,
        "\n");
        parametersTable5.addCell(_createCell(value10.toString(), false, 1, true));
        Object value11 =
        _programObject.getValuesOfParameterAsString("radiusF5.6CameraHead1", 10, "\n");
        parametersTable5.addCell(_createCell(value11.toString(), false, 1, true));

        PdfPTable parametersTable6 = new PdfPTable(2);
        parametersTable6.setSpacingBefore(20.0f);
        parametersTable6.addCell(_createCell("Relative Grayvalue (Normalized to max) F8",
        false, 1, true));
        parametersTable6.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value12 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF8CameraHead1", 10,
        "\n");
        parametersTable6.addCell(_createCell(value12.toString(), false, 1, true));
        Object value13 = _programObject.getValuesOfParameterAsString("radiusF8CameraHead1",
        10, "\n");
        parametersTable6.addCell(_createCell(value13.toString(), false, 1, true));


        _pdfDocument.add(parametersTable);
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(parametersTable2);
        _pdfDocument.add(parametersTable3);
        _pdfDocument.add(parametersTable4);
        _pdfDocument.add(parametersTable5);
        _pdfDocument.add(parametersTable6);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page36() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Noise (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
```

```
        _pdfDocument.add(new Paragraph("Sensor noise shows image noise with respect to the
        image center measured at an aperture of "
        +_programObject.getFirstValueOfParameter("imageNoiseApertureCameraHead") + " with
        exposure time of " +
        _programObject.getFirstValueOfParameter("exposureTimeCameraHead") + "msec. " +
        _programObject.getFirstValueOfParameter("descriptionOfSensorNoise") + " This is a
        camera type specific calibration." , _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Image Noise", _font14bold));
        _pdfDocument.add(new Paragraph("Sensor Noise before Normalization", _font14));


        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
        parametersTable.addCell(_createCell("Image Brightness [Grayvalue]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("noiseCameraBeforeNormalizationCameraHead
        ", 15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("imageBrightnessBeforeNormalizationCamera
        Head", 15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
        parametersTable1.addCell(_createCell("Image Brightness [Grayvalue]", false, 1,
        true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("noiseCameraAfterNormalizationCameraHead"
        , 15, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 =
        _programObject.getValuesOfParameterAsString("imageBrightnessAfterNormalizationCameraH
        ead", 15, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Sensor Noise after Normalization", _font14));
        _pdfDocument.add(parametersTable1);

        _pdfDocument.newPage();
    }

    private void _page35() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Linearity (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfLinearity") + " This
        is a camera type specific calibration.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Below table shows the linearity of the raw sensor
        and after flat fielding:", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Linearity", _font14bold));
        _pdfDocument.add(new Paragraph("Intermediate", _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadIntermediate", 10,
```

```
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("lightCameraHeadIntermediate", 10, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable1.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadRaw", 10, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 = _programObject.getValuesOfParameterAsString("lightCameraHeadRaw",
        10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Raw", _font14));
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Senor Linearity from Light Level 0 (dark) to (100 %
        = Saturation)", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The deviation from the linearity is below
        "+_programObject.getFirstValueOfParameter("deviationFromTheLinearityCameraHead") +
        "%.", _font14));

        _pdfDocument.newPage();
    }

    private void _page34() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensitivity of " +
        _programObject.getFirstValueOfParameter("cameraHead1"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Spectral response curve of the single camera head.",
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraName")+ " Relative Spectral
        Response", _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Spectral Response", false, 1, true));
        parametersTable.addCell(_createCell("Wavelength [nm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeSpectralResponseCameraHead1",
        15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("wavelengthCameraHead1",
        15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfSensitivity"),
        _font14));

        _pdfDocument.newPage();
    }

    private void _page33() throws DocumentException {
        _pdfDocument.add(new Paragraph("Optical System", _font20));
```

```
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Modulation Transfer Function, MTF of " +
        _programObject.getFirstValueOfParameter("cameraHead1"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph(
        _programObject.getFirstValueOfParameter("cameraName")+ " " +
        _programObject.getFirstValueOfParameter("cameraHead1") + "-MTF Polychromatic F/4.0;
        " + _programObject.getFirstValueOfParameter("temperatureStabilityCameraHead")+ "
        [mm]-Temperature Stability", _font14));

        PdfPTable table = new PdfPTable(2);
        table.setSpacingBefore(20.0f);
        table.addCell(_createCell("Modulation Transfer Function", false, 1, true));
        table.addCell(_createCell("Temperature", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("modulationTransferFunctionCameraHead1",
        20, "\n");
        table.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("temperatureForMTFCameraHead1", 20, "\n");
        table.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(table);

        _pdfDocument.newPage();
    }

    private void _page32() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Defect Pixel", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHead2")+ " ("+
        _programObject.getFirstValueOfParameter("serialNumberCameraHead2") + ")" , _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Defect pixels are detected during radiometric
        calibration and will be corrected during radiometric processing of the images. The
        quantity and cumulative percentage and specification of defects is described in
        Appendix “Defect Pixel Recognition”.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Revision of calibration:
        "+_programObject.getFirstValueOfParameter("revisionOfCalibration"), _font14));
        _pdfDocument.add(new Paragraph("CCDRevision:
        "+_programObject.getFirstValueOfParameter("ccdRevision"), _font14));
        _pdfDocument.add(new Paragraph("Date Number:
        "+_programObject.getFirstValueOfParameter("dataNumberCameraHead2"), _font14));
        _pdfDocument.add(new Paragraph("Date:
        "+_programObject.getFirstValueOfParameter("dateDefectPixel"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Number of defect pixels:
        "+_programObject.getFirstValueOfParameter("numberOfDefectPixelsCameraHead2"),
        _font14));
        _pdfDocument.add(new Paragraph("Number of defect clusters:
        "+_programObject.getFirstValueOfParameter("numberOfDefectClustersCameraHead2"),
        _font14));
        _pdfDocument.add(new Paragraph("Number of defect columns:
        "+_programObject.getFirstValueOfParameter("numberOfDefectColumnsCameraHead2"),
        _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Row", false, 1, true));
        parametersTable.addCell(_createCell("Column", false, 1, true));
        Object value = _programObject.getValuesOfParameterAsString("rowCameraHead2", 200,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, false));
```

```
        Object value1 = _programObject.getValuesOfParameterAsString("columnCameraHead2",
        200, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, false));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page31() throws DocumentException {
          _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Aperture Correction", _font16));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new
          Paragraph(_programObject.getFirstValueOfParameter("cameraHead2")+ " ("+
          _programObject.getFirstValueOfParameter("serialNumberCameraHead2") + ")" ,
          _font16));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new
          Paragraph(_programObject.getFirstValueOfParameter("lightFalloff"), _font14));
          _pdfDocument.add(new
          Paragraph(_programObject.getFirstValueOfParameter("figureLightFallOff"), _font14));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new
          Paragraph(_programObject.getFirstValueOfParameter("cameraHead2") + " " +
          _programObject.getFirstValueOfParameter("cameraName"), _font14bold));

          PdfPTable parametersTable = new PdfPTable(2);
          parametersTable.setSpacingBefore(20.0f);
          parametersTable.addCell(_createCell("Relative Grayvalue (Normalized to max) F11",
          false, 1, true));
          parametersTable.addCell(_createCell("Radius [mm]", false, 1, true));
          Object value =
          _programObject.getValuesOfParameterAsString("relativeGrayvalueF11CameraHead2", 10,
          "\n");
          parametersTable.addCell(_createCell(value.toString(), false, 1, true));
          Object value1 =
          _programObject.getValuesOfParameterAsString("radiusF11CameraHead2", 10, "\n");
          parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

          PdfPTable parametersTable1 = new PdfPTable(2);
          parametersTable1.setSpacingBefore(20.0f);
          parametersTable1.addCell(_createCell("Relative Grayvalue (Normalized to max) F16",
          false, 1, true));
          parametersTable1.addCell(_createCell("Radius [mm]", false, 1, true));
          Object value2 =
          _programObject.getValuesOfParameterAsString("relativeGrayvalueF16CameraHead2", 10,
          "\n");
          parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
          Object value3 =
          _programObject.getValuesOfParameterAsString("radiusF16CameraHead2", 10, "\n");
          parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

          PdfPTable parametersTable2 = new PdfPTable(2);
          parametersTable2.setSpacingBefore(20.0f);
          parametersTable2.addCell(_createCell("Relative Grayvalue (Normalized to max) F22",
          false, 1, true));
          parametersTable2.addCell(_createCell("Radius [mm]", false, 1, true));
          Object value4 =
          _programObject.getValuesOfParameterAsString("relativeGrayvalueF22CameraHead2", 10,
          "\n");
          parametersTable2.addCell(_createCell(value4.toString(), false, 1, true));
          Object value5 =
          _programObject.getValuesOfParameterAsString("radiusF22CameraHead2", 10, "\n");
```

```
        parametersTable2.addCell(_createCell(value5.toString(), false, 1, true));

        PdfPTable parametersTable3 = new PdfPTable(2);
        parametersTable3.setSpacingBefore(20.0f);
        parametersTable3.addCell(_createCell("Relative Grayvalue (Normalized to max)
        F2.8", false, 1, true));
        parametersTable3.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value6 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF2.8CameraHead2",
        10, "\n");
        parametersTable3.addCell(_createCell(value6.toString(), false, 1, true));
        Object value7 =
        _programObject.getValuesOfParameterAsString("radiusF2.8CameraHead2", 10, "\n");
        parametersTable3.addCell(_createCell(value7.toString(), false, 1, true));

        PdfPTable parametersTable4 = new PdfPTable(2);
        parametersTable4.setSpacingBefore(20.0f);
        parametersTable4.addCell(_createCell("Relative Grayvalue (Normalized to max) F4",
        false, 1, true));
        parametersTable4.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value8 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF4CameraHead2", 10,
        "\n");
        parametersTable4.addCell(_createCell(value8.toString(), false, 1, true));
        Object value9 = _programObject.getValuesOfParameterAsString("radiusF4CameraHead2",
        10, "\n");
        parametersTable4.addCell(_createCell(value9.toString(), false, 1, true));

        PdfPTable parametersTable5 = new PdfPTable(2);
        parametersTable5.setSpacingBefore(20.0f);
        parametersTable5.addCell(_createCell("Relative Grayvalue (Normalized to max)
        F5.6", false, 1, true));
        parametersTable5.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value10 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF5.6CameraHead2",
        10, "\n");
        parametersTable5.addCell(_createCell(value10.toString(), false, 1, true));
        Object value11 =
        _programObject.getValuesOfParameterAsString("radiusF5.6CameraHead2", 10, "\n");
        parametersTable5.addCell(_createCell(value11.toString(), false, 1, true));

        PdfPTable parametersTable6 = new PdfPTable(2);
        parametersTable6.setSpacingBefore(20.0f);
        parametersTable6.addCell(_createCell("Relative Grayvalue (Normalized to max) F8",
        false, 1, true));
        parametersTable6.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value12 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF8CameraHead2", 10,
        "\n");
        parametersTable6.addCell(_createCell(value12.toString(), false, 1, true));
        Object value13 =
        _programObject.getValuesOfParameterAsString("radiusF8CameraHead2", 10, "\n");
        parametersTable6.addCell(_createCell(value13.toString(), false, 1, true));


        _pdfDocument.add(parametersTable);
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(parametersTable2);
        _pdfDocument.add(parametersTable3);
        _pdfDocument.add(parametersTable4);
        _pdfDocument.add(parametersTable5);
        _pdfDocument.add(parametersTable6);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }
```

```
    private void _page30() throws DocumentException {
         _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Sensor Noise (Reference)", _font16));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Sensor noise shows image noise with respect to the
         image center measured at an aperture of "
         +_programObject.getFirstValueOfParameter("imageNoiseApertureCameraHead") + " with
         exposure time of " +
         _programObject.getFirstValueOfParameter("exposureTimeCameraHead") + "msec. " +
         _programObject.getFirstValueOfParameter("descriptionOfSensorNoise") + " This is a
         camera type specific calibration." , _font14));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Image Noise", _font14bold));
         _pdfDocument.add(new Paragraph("Sensor Noise before Normalization", _font14));

         PdfPTable parametersTable = new PdfPTable(2);
         parametersTable.setSpacingBefore(20.0f);
         parametersTable.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
         parametersTable.addCell(_createCell("Image Brightness [Grayvalue]", false, 1, true));
         Object value =
         _programObject.getValuesOfParameterAsString("noiseCameraBeforeNormalizationCameraHead
         ", 11, "\n");
         parametersTable.addCell(_createCell(value.toString(), false, 1, true));
         Object value1 =
         _programObject.getValuesOfParameterAsString("imageBrightnessBeforeNormalizationCamera
         Head", 11, "\n");
         parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

         PdfPTable parametersTable1 = new PdfPTable(2);
         parametersTable1.setSpacingBefore(20.0f);
         parametersTable1.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
         parametersTable1.addCell(_createCell("Image Brightness [Grayvalue]", false, 1,
         true));
         Object value2 =
         _programObject.getValuesOfParameterAsString("noiseCameraAfterNormalizationCameraHead"
         , 11, "\n");
         parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
         Object value3 =
         _programObject.getValuesOfParameterAsString("imageBrightnessAfterNormalizationCameraH
         ead", 11, "\n");
         parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

         _pdfDocument.add(parametersTable);
         _pdfDocument.add(new Paragraph("Sensor Noise after Normalization", _font14));
         _pdfDocument.add(parametersTable1);

         _pdfDocument.newPage();
    }

    private void _page29() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Linearity (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfLinearity") + " This
        is a camera type specific calibration.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Below table shows the linearity of the raw sensor
        and after flat fielding:", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Linearity", _font14bold));
        _pdfDocument.add(new Paragraph("Intermediate", _font14));

        PdfPTable parametersTable = new PdfPTable(2);
```

```
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadIntermediate", 10,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("lightCameraHeadIntermediate", 10, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable1.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadRaw", 10, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 = _programObject.getValuesOfParameterAsString("lightCameraHeadRaw",
        10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Raw", _font14));
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Senor Linearity from Light Level 0 (dark) to (100 %
        = Saturation)", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The deviation from the linearity is below
        "+_programObject.getFirstValueOfParameter("deviationFromTheLinearityCameraHead") +
        "%.", _font14));

        _pdfDocument.newPage();
    }

    private void _page28() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensitivity of " +
        _programObject.getFirstValueOfParameter("cameraHead2"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Spectral response curve of the single camera head.",
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraName")+ " Relative Spectral
        Response", _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Spectral Response", false, 1, true));
        parametersTable.addCell(_createCell("Wavelength [nm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeSpectralResponseCameraHead2",
        15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("wavelengthCameraHead2",
        15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfSensitivity"),
        _font14));
```

```
        _pdfDocument.newPage();
    }

    private void _page27() throws DocumentException {
        _pdfDocument.add(new Paragraph("Optical System", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Modulation Transfer Function, MTF of " +
        _programObject.getFirstValueOfParameter("cameraHead2"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph(
        _programObject.getFirstValueOfParameter("cameraName")+ " " +
        _programObject.getFirstValueOfParameter("cameraHead2") + "-MTF Polychromatic F/4.0;
        " + _programObject.getFirstValueOfParameter("temperatureStabilityCameraHead")+ "
        [mm]-Temperature Stability", _font14));

        PdfPTable table = new PdfPTable(2);
        table.setSpacingBefore(20.0f);
        table.addCell(_createCell("Modulation Transfer Function", false, 1, true));
        table.addCell(_createCell("Temperature", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("modulationTransferFunctionCameraHead2",
        20, "\n");
        table.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("temperatureForMTFCameraHead2", 20, "\n");
        table.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(table);

        _pdfDocument.newPage();
    }

    private void _page26() throws DocumentException {
         _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Defect Pixel", _font16));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new
         Paragraph(_programObject.getFirstValueOfParameter("cameraHead3") + " (" +
         _programObject.getFirstValueOfParameter("serialNumberCameraHead3") + ")" , _font16));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Defect pixels are detected during radiometric
         calibration and will be corrected during radiometric processing of the images. The
         quantity and cumulative percentage and specification of defects is described in
         Appendix "Defect Pixel Recognition".", _font14));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Revision of calibration:
         "+_programObject.getFirstValueOfParameter("revisionOfCalibration"), _font14));
         _pdfDocument.add(new Paragraph("CCDRevision:
         "+_programObject.getFirstValueOfParameter("ccdRevision"), _font14));
         _pdfDocument.add(new Paragraph("Date Number:
         "+_programObject.getFirstValueOfParameter("dataNumberCameraHead3"), _font14));
         _pdfDocument.add(new Paragraph("Date:
         "+_programObject.getFirstValueOfParameter("dateDefectPixel"), _font14));
         _pdfDocument.add(Chunk.NEWLINE);
         _pdfDocument.add(new Paragraph("Number of defect pixels:
         "+_programObject.getFirstValueOfParameter("numberOfDefectPixelsCameraHead3"),
         _font14));
         _pdfDocument.add(new Paragraph("Number of defect clusters:
         "+_programObject.getFirstValueOfParameter("numberOfDefectClustersCameraHead3"),
         _font14));
         _pdfDocument.add(new Paragraph("Number of defect columns:
         "+_programObject.getFirstValueOfParameter("numberOfDefectColumnsCameraHead3"),
         _font14));

         PdfPTable parametersTable = new PdfPTable(2);
         parametersTable.setSpacingBefore(20.0f);
```

```
        parametersTable.addCell(_createCell("Row", false, 1, true));
        parametersTable.addCell(_createCell("Column", false, 1, true));
        Object value = _programObject.getValuesOfParameterAsString("rowCameraHead3", 200,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, false));
        Object value1 = _programObject.getValuesOfParameterAsString("columnCameraHead3",
        200, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, false));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page25() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Aperture Correction", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHead3")+ " ("+
        _programObject.getFirstValueOfParameter("serialNumberCameraHead3") + ")" ,
        _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("lightFalloff"), _font14));
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("figureLightFallOff"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHead3") + " " +
        _programObject.getFirstValueOfParameter("cameraName"), _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Grayvalue (Normalized to max) F11",
        false, 1, true));
        parametersTable.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF11CameraHead3", 10,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("radiusF11CameraHead3", 10, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Relative Grayvalue (Normalized to max) F16",
        false, 1, true));
        parametersTable1.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF16CameraHead3", 10,
        "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 =
        _programObject.getValuesOfParameterAsString("radiusF16CameraHead3", 10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        PdfPTable parametersTable2 = new PdfPTable(2);
        parametersTable2.setSpacingBefore(20.0f);
        parametersTable2.addCell(_createCell("Relative Grayvalue (Normalized to max) F22",
        false, 1, true));
        parametersTable2.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value4 =
```

```
_programObject.getValuesOfParameterAsString("relativeGrayvalueF22CameraHead3", 10,
"\n");
parametersTable2.addCell(_createCell(value4.toString(), false, 1, true));
Object value5 =
_programObject.getValuesOfParameterAsString("radiusF22CameraHead3", 10, "\n");
parametersTable2.addCell(_createCell(value5.toString(), false, 1, true));

PdfPTable parametersTable3 = new PdfPTable(2);
parametersTable3.setSpacingBefore(20.0f);
parametersTable3.addCell(_createCell("Relative Grayvalue (Normalized to max)
F2.8", false, 1, true));
parametersTable3.addCell(_createCell("Radius [mm]", false, 1, true));
Object value6 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF2.8CameraHead3",
10, "\n");
parametersTable3.addCell(_createCell(value6.toString(), false, 1, true));
Object value7 =
_programObject.getValuesOfParameterAsString("radiusF2.8CameraHead3", 10, "\n");
parametersTable3.addCell(_createCell(value7.toString(), false, 1, true));

PdfPTable parametersTable4 = new PdfPTable(2);
parametersTable4.setSpacingBefore(20.0f);
parametersTable4.addCell(_createCell("Relative Grayvalue (Normalized to max) F4",
false, 1, true));
parametersTable4.addCell(_createCell("Radius [mm]", false, 1, true));
Object value8 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF4CameraHead3", 10,
"\n");
parametersTable4.addCell(_createCell(value8.toString(), false, 1, true));
Object value9 = _programObject.getValuesOfParameterAsString("radiusF4CameraHead3",
10, "\n");
parametersTable4.addCell(_createCell(value9.toString(), false, 1, true));

PdfPTable parametersTable5 = new PdfPTable(2);
parametersTable5.setSpacingBefore(20.0f);
parametersTable5.addCell(_createCell("Relative Grayvalue (Normalized to max)
F5.6", false, 1, true));
parametersTable5.addCell(_createCell("Radius [mm]", false, 1, true));
Object value10 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF5.6CameraHead3",
10, "\n");
parametersTable5.addCell(_createCell(value10.toString(), false, 1, true));
Object value11 =
_programObject.getValuesOfParameterAsString("radiusF5.6CameraHead3", 10, "\n");
parametersTable5.addCell(_createCell(value11.toString(), false, 1, true));

PdfPTable parametersTable6 = new PdfPTable(2);
parametersTable6.setSpacingBefore(20.0f);
parametersTable6.addCell(_createCell("Relative Grayvalue (Normalized to max) F8",
false, 1, true));
parametersTable6.addCell(_createCell("Radius [mm]", false, 1, true));
Object value12 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF8CameraHead3", 10,
"\n");
parametersTable6.addCell(_createCell(value12.toString(), false, 1, true));
Object value13 =
_programObject.getValuesOfParameterAsString("radiusF8CameraHead3", 10, "\n");
parametersTable6.addCell(_createCell(value13.toString(), false, 1, true));

_pdfDocument.add(parametersTable);
_pdfDocument.add(parametersTable1);
_pdfDocument.add(parametersTable2);
_pdfDocument.add(parametersTable3);
_pdfDocument.add(parametersTable4);
_pdfDocument.add(parametersTable5);
_pdfDocument.add(parametersTable6);
_pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
```

```
        _font14));

        _pdfDocument.newPage();
    }

    private void _page24() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Noise (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor noise shows image noise with respect to the
        image center measured at an aperture of "
        +_programObject.getFirstValueOfParameter("imageNoiseApertureCameraHead") + " with
        exposure time of " +
        _programObject.getFirstValueOfParameter("exposureTimeCameraHead") + "msec. " +
        _programObject.getFirstValueOfParameter("descriptionOfSensorNoise") + " This is a
        camera type specific calibration." , _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Image Noise", _font14bold));
        _pdfDocument.add(new Paragraph("Sensor Noise before Normalization", _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
        parametersTable.addCell(_createCell("Image Brightness [Grayvalue]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("noiseCameraBeforeNormalizationCameraHead
        ", 11, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("imageBrightnessBeforeNormalizationCamera
        Head", 11, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
        parametersTable1.addCell(_createCell("Image Brightness [Grayvalue]", false, 1,
        true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("noiseCameraAfterNormalizationCameraHead"
        , 11, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 =
        _programObject.getValuesOfParameterAsString("imageBrightnessAfterNormalizationCameraH
        ead", 11, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Sensor Noise after Normalization", _font14));
        _pdfDocument.add(parametersTable1);

        _pdfDocument.newPage();
    }

    private void _page23() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Linearity (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfLinearity") + "
        This is a camera type specific calibration.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Below table shows the linearity of the raw sensor
        and after flat fielding:", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
```

```
        _pdfDocument.add(new Paragraph("Linearity", _font14bold));
        _pdfDocument.add(new Paragraph("Intermediate", _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadIntermediate", 10,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("lightCameraHeadIntermediate", 10, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable1.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadRaw", 10, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 = _programObject.getValuesOfParameterAsString("lightCameraHeadRaw",
        10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Raw", _font14));
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Senor Linearity from Light Level 0 (dark) to (100 %
        = Saturation)", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The deviation from the linearity is below
        "+_programObject.getFirstValueOfParameter("deviationFromTheLinearityCameraHead") +
        "%.", _font14));

        _pdfDocument.newPage();


    }

    private void _page22() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensitivity of " +
        _programObject.getFirstValueOfParameter("cameraHead3"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Spectral response curve of the single camera
        head.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraName")+ " Relative
        Spectral Response", _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Spectral Response", false, 1, true));
        parametersTable.addCell(_createCell("Wavelength [nm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeSpectralResponseCameraHead3",
        15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("wavelengthCameraHead3", 15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));
```

```
        _pdfDocument.add(parametersTable);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfSensitivity"),
        _font14));

        _pdfDocument.newPage();
    }

    private void _page21() throws DocumentException {
        _pdfDocument.add(new Paragraph("Optical System", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Modulation Transfer Function, MTF of " +
        _programObject.getFirstValueOfParameter("cameraHead3"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph(
        _programObject.getFirstValueOfParameter("cameraName")+ " " +
        _programObject.getFirstValueOfParameter("cameraHead3") + "-MTF Polychromatic F/4.0;
        " + _programObject.getFirstValueOfParameter("temperatureStabilityCameraHead")+ "
        [mm]-Temperature Stability", _font14));

        PdfPTable table = new PdfPTable(2);
        table.setSpacingBefore(20.0f);
        table.addCell(_createCell("Modulation Transfer Function", false, 1, true));
        table.addCell(_createCell("Temperature", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("modulationTransferFunctionCameraHead3",
        20, "\n");
        table.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("temperatureForMTFCameraHead3", 20,
        "\n");
        table.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(table);

        _pdfDocument.newPage();
    }

    private void _page20() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Defect Pixel", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHead4")+ " ("+
        _programObject.getFirstValueOfParameter("serialNumberCameraHead4") + ")" , _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Defect pixels are detected during radiometric
        calibration and will be corrected during radiometric processing of the images. The
        quantity and cumulative percentage and specification of defects is described in
        Appendix "Defect Pixel Recognition".", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Revision of calibration:
        "+_programObject.getFirstValueOfParameter("revisionOfCalibration"), _font14));
        _pdfDocument.add(new Paragraph("CCDRevision:
        "+_programObject.getFirstValueOfParameter("ccdRevision"), _font14));
        _pdfDocument.add(new Paragraph("Date Number:
        "+_programObject.getFirstValueOfParameter("dataNumberCameraHead4"), _font14));
        _pdfDocument.add(new Paragraph("Date:
        "+_programObject.getFirstValueOfParameter("dateDefectPixel"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Number of defect pixels:
        "+_programObject.getFirstValueOfParameter("numberOfDefectPixelsCameraHead4"),
        _font14));
        _pdfDocument.add(new Paragraph("Number of defect clusters:
        "+_programObject.getFirstValueOfParameter("numberOfDefectClustersCameraHead4"),
```

```
        _font14));
        _pdfDocument.add(new Paragraph("Number of defect columns:
        "+_programObject.getFirstValueOfParameter("numberOfDefectColumnsCameraHead4"),
        _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Row", false, 1, false));
        parametersTable.addCell(_createCell("Column", false, 1, false));
        Object value = _programObject.getValuesOfParameterAsString("rowCameraHead4", 200,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, false));
        Object value1 = _programObject.getValuesOfParameterAsString("columnCameraHead4",
        200, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, false));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page19() throws DocumentException {
      _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
      _pdfDocument.add(Chunk.NEWLINE);
      _pdfDocument.add(new Paragraph("Aperture Correction", _font16));
      _pdfDocument.add(Chunk.NEWLINE);
      _pdfDocument.add(new Paragraph(_programObject.getFirstValueOfParameter("cameraHead4")+
      " ("+ _programObject.getFirstValueOfParameter("serialNumberCameraHead4") + ")" ,
      _font16));
      _pdfDocument.add(Chunk.NEWLINE);
      _pdfDocument.add(new
      Paragraph(_programObject.getFirstValueOfParameter("lightFalloff"), _font14));
      _pdfDocument.add(new
      Paragraph(_programObject.getFirstValueOfParameter("figureLightFallOff"), _font14));
      _pdfDocument.add(Chunk.NEWLINE);
      _pdfDocument.add(new Paragraph(_programObject.getFirstValueOfParameter("cameraHead4")
      + " " + _programObject.getFirstValueOfParameter("cameraName"), _font14bold));

      PdfPTable parametersTable = new PdfPTable(2);
      parametersTable.setSpacingBefore(20.0f);
      parametersTable.addCell(_createCell("Relative Grayvalue (Normalized to max) F11",
      false, 1, true));
      parametersTable.addCell(_createCell("Radius [mm]", false, 1, true));
      Object value =
      _programObject.getValuesOfParameterAsString("relativeGrayvalueF11CameraHead4", 10,
      "\n");
      parametersTable.addCell(_createCell(value.toString(), false, 1, true));
      Object value1 = _programObject.getValuesOfParameterAsString("radiusF11CameraHead4",
      10, "\n");
      parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

      PdfPTable parametersTable1 = new PdfPTable(2);
      parametersTable1.setSpacingBefore(20.0f);
      parametersTable1.addCell(_createCell("Relative Grayvalue (Normalized to max) F16",
      false, 1, true));
      parametersTable1.addCell(_createCell("Radius [mm]", false, 1, true));
      Object value2 =
      _programObject.getValuesOfParameterAsString("relativeGrayvalueF16CameraHead4", 10,
      "\n");
      parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
      Object value3 = _programObject.getValuesOfParameterAsString("radiusF16CameraHead4",
      10, "\n");
      parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

      PdfPTable parametersTable2 = new PdfPTable(2);
```

```
parametersTable2.setSpacingBefore(20.0f);
parametersTable2.addCell(_createCell("Relative Grayvalue (Normalized to max) F22",
false, 1, true));
parametersTable2.addCell(_createCell("Radius [mm]", false, 1, true));
Object value4 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF22CameraHead4", 10,
"\n");
parametersTable2.addCell(_createCell(value4.toString(), false, 1, true));
Object value5 = _programObject.getValuesOfParameterAsString("radiusF22CameraHead4",
10, "\n");
parametersTable2.addCell(_createCell(value5.toString(), false, 1, true));

PdfPTable parametersTable3 = new PdfPTable(2);
parametersTable3.setSpacingBefore(20.0f);
parametersTable3.addCell(_createCell("Relative Grayvalue (Normalized to max) F2.8",
false, 1, true));
parametersTable3.addCell(_createCell("Radius [mm]", false, 1, true));
Object value6 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF2.8CameraHead4", 10,
"\n");
parametersTable3.addCell(_createCell(value6.toString(), false, 1, true));
Object value7 = _programObject.getValuesOfParameterAsString("radiusF2.8CameraHead4",
10, "\n");
parametersTable3.addCell(_createCell(value7.toString(), false, 1, true));

PdfPTable parametersTable4 = new PdfPTable(2);
parametersTable4.setSpacingBefore(20.0f);
parametersTable4.addCell(_createCell("Relative Grayvalue (Normalized to max) F4",
false, 1, true));
parametersTable4.addCell(_createCell("Radius [mm]", false, 1, true));
Object value8 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF4CameraHead4", 10, "\n");
parametersTable4.addCell(_createCell(value8.toString(), false, 1, true));
Object value9 = _programObject.getValuesOfParameterAsString("radiusF4CameraHead4", 10,
"\n");
parametersTable4.addCell(_createCell(value9.toString(), false, 1, true));

PdfPTable parametersTable5 = new PdfPTable(2);
parametersTable5.setSpacingBefore(20.0f);
parametersTable5.addCell(_createCell("Relative Grayvalue (Normalized to max) F5.6",
false, 1, true));
parametersTable5.addCell(_createCell("Radius [mm]", false, 1, true));
Object value10 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF5.6CameraHead4", 10,
"\n");
parametersTable5.addCell(_createCell(value10.toString(), false, 1, true));
Object value11 = _programObject.getValuesOfParameterAsString("radiusF5.6CameraHead4",
10, "\n");
parametersTable5.addCell(_createCell(value11.toString(), false, 1, true));

PdfPTable parametersTable6 = new PdfPTable(2);
parametersTable6.setSpacingBefore(20.0f);
parametersTable6.addCell(_createCell("Relative Grayvalue (Normalized to max) F8",
false, 1, true));
parametersTable6.addCell(_createCell("Radius [mm]", false, 1, true));
Object value12 =
_programObject.getValuesOfParameterAsString("relativeGrayvalueF8CameraHead4", 10, "\n");
parametersTable6.addCell(_createCell(value12.toString(), false, 1, true));
Object value13 = _programObject.getValuesOfParameterAsString("radiusF8CameraHead4",
10, "\n");
parametersTable6.addCell(_createCell(value13.toString(), false, 1, true));

_pdfDocument.add(parametersTable);
_pdfDocument.add(parametersTable1);
_pdfDocument.add(parametersTable2);
_pdfDocument.add(parametersTable3);
_pdfDocument.add(parametersTable4);
```

```
        _pdfDocument.add(parametersTable5);
        _pdfDocument.add(parametersTable6);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.", _font14));

        _pdfDocument.newPage();
    }

    private void _page18() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Noise (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor noise shows image noise with respect to the
        image center measured at an aperture of "
        +_programObject.getFirstValueOfParameter("imageNoiseApertureCameraHead") + " with
        exposure time of " +
        _programObject.getFirstValueOfParameter("exposureTimeCameraHead") + "msec. " +
        _programObject.getFirstValueOfParameter("descriptionOfSensorNoise") + " This is a
        camera type specific calibration." , _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Image Noise", _font14bold));
        _pdfDocument.add(new Paragraph("Sensor Noise before Normalization", _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
        parametersTable.addCell(_createCell("Image Brightness [Grayvalue]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("noiseCameraBeforeNormalizationCameraHead"
        , 15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("imageBrightnessBeforeNormalizationCameraH
        ead", 15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Noise [Grayvalue]", false, 1, true));
        parametersTable1.addCell(_createCell("Image Brightness [Grayvalue]", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("noiseCameraAfterNormalizationCameraHead",
         15, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 =
        _programObject.getValuesOfParameterAsString("imageBrightnessAfterNormalizationCameraHe
        ad", 15, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Sensor Noise after Normalization", _font14));
        _pdfDocument.add(parametersTable1);

        _pdfDocument.newPage();
    }

    private void _page17() throws DocumentException {
          _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Sensor Linearity (Reference)", _font16));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new
          Paragraph(_programObject.getFirstValueOfParameter("descriptionOfLinearity") + "
          This is a camera type specific calibration.", _font14));
          _pdfDocument.add(Chunk.NEWLINE);
          _pdfDocument.add(new Paragraph("Below table shows the linearity of the raw sensor
          and after flat fielding:", _font14));
```

```
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Linearity", _font14bold));
        _pdfDocument.add(new Paragraph("Intermediate", _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadIntermediate", 10,
        "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("lightCameraHeadIntermediate", 10,
        "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Grayvalue", false, 1, true));
        parametersTable1.addCell(_createCell("Light (100= Saturated)", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("grayvalueCameraHeadRaw", 10, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 = _programObject.getValuesOfParameterAsString("lightCameraHeadRaw",
        10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(new Paragraph("Raw", _font14));
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Senor Linearity from Light Level 0 (dark) to (100
        % = Saturation)", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The deviation from the linearity is below
        "+_programObject.getFirstValueOfParameter("deviationFromTheLinearityCameraHead") +
        "%.", _font14));

        _pdfDocument.newPage();
    }

    private void _page16() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensitivity of " +
        _programObject.getFirstValueOfParameter("cameraHead4"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Spectral response curve of the single camera head.",
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraName")+ " Relative Spectral
        Response", _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Spectral Response", false, 1, true));
        parametersTable.addCell(_createCell("Wavelength [nm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeSpectralResponseCameraHead4",
        15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("wavelengthCameraHead4",
        15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));
```

```
        _pdfDocument.add(parametersTable);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfSensitivity"),
        _font14));

        _pdfDocument.newPage();
    }

    private void _page15() throws DocumentException {
        _pdfDocument.add(new Paragraph("Optical System", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Modulation Transfer Function, MTF of " +
        _programObject.getFirstValueOfParameter("cameraHead4"), _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph(
        _programObject.getFirstValueOfParameter("cameraName")+ " " +
        _programObject.getFirstValueOfParameter("cameraHead4") + "-MTF Polychromatic F/4.0;
        " + _programObject.getFirstValueOfParameter("temperatureStabilityCameraHead")+ "
        [mm]-Temperature Stability", _font14));

        PdfPTable table = new PdfPTable(2);
        table.setSpacingBefore(20.0f);
        table.addCell(_createCell("Modulation Transfer Function", false, 1, true));
        table.addCell(_createCell("Temperature", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("modulationTransferFunctionCameraHead4",
        20, "\n");
        table.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("temperatureForMTFCameraHead4", 20,
        "\n");
        table.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(table);

        _pdfDocument.newPage();
    }

    private void _page12() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Defect Pixel", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Camera
        "+_programObject.getFirstValueOfParameter("cameraHeadReference")+ " ("+
        _programObject.getFirstValueOfParameter("serialNumberReference") + ")" , _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Defect pixels are detected during radiometric
        calibration and will be corrected during radiometric processing of the images. The
        quantity and cumulative percentage and specification of defects is described in
        Appendix “Defect Pixel Recognition”.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Revision of calibration:
        "+_programObject.getFirstValueOfParameter("revisionOfCalibration"), _font14));
        _pdfDocument.add(new Paragraph("CCDRevision:
        "+_programObject.getFirstValueOfParameter("ccdRevision"), _font14));
        _pdfDocument.add(new Paragraph("Date Number:
        "+_programObject.getFirstValueOfParameter("dataNumberPAN"), _font14));
        _pdfDocument.add(new Paragraph("Date:
        "+_programObject.getFirstValueOfParameter("dateDefectPixel"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Number of defect pixels:
        "+_programObject.getFirstValueOfParameter("numberOfDefectPixelsPAN"), _font14));
        _pdfDocument.add(new Paragraph("Number of defect clusters:
        "+_programObject.getFirstValueOfParameter("numberOfDefectClustersPAN"), _font14));
        _pdfDocument.add(new Paragraph("Number of defect columns:
```

```
        "+_programObject.getFirstValueOfParameter("numberOfDefectColumnsPAN"), _font14));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Row", false, 1, true));
        parametersTable.addCell(_createCell("Column", false, 1, true));
        Object value = _programObject.getValuesOfParameterAsString("rowPAN", 200, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, false));
        Object value1 = _programObject.getValuesOfParameterAsString("columnPAN", 200, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, false));

        _pdfDocument.add(parametersTable);

        _pdfDocument.newPage();
    }

    private void _page11() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Aperture Correction (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Camera
        "+_programObject.getFirstValueOfParameter("cameraHeadReference")+ " ("+
        _programObject.getFirstValueOfParameter("serialNumberReference") + ")" , _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("lightFalloff"), _font14));
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("figureLightFallOff"), _font14));
        _pdfDocument.add(new Paragraph("Compensation of the light fall off can be measured
        after normalization and is within
        ±"+_programObject.getFirstValueOfParameter("compersationOfLightFallOff")+ "% of the
        dynamic range.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Light fall off and correction after normalization
        for "+_programObject.getFirstValueOfParameter("cameraHeadReference")+ " sensor",
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraHeadReference")+ " " +
        _programObject.getFirstValueOfParameter("cameraName"), _font14bold));

        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Grayvalue (Normalized to max) F11",
        false, 1, true));
        parametersTable.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF11PAN", 10, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("radiusF11PAN", 10, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Relative Grayvalue (Normalized to max) F16",
        false, 1, true));
        parametersTable1.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF16PAN", 10, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 = _programObject.getValuesOfParameterAsString("radiusF16PAN", 10, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        PdfPTable parametersTable2 = new PdfPTable(2);
        parametersTable2.setSpacingBefore(20.0f);
        parametersTable2.addCell(_createCell("Relative Grayvalue (Normalized to max) F22",
```

```
        false, 1, true));
        parametersTable2.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value4 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF22PAN", 10, "\n");
        parametersTable2.addCell(_createCell(value4.toString(), false, 1, true));
        Object value5 = _programObject.getValuesOfParameterAsString("radiusF22PAN", 10, "\n");
        parametersTable2.addCell(_createCell(value5.toString(), false, 1, true));

        PdfPTable parametersTable3 = new PdfPTable(2);
        parametersTable3.setSpacingBefore(20.0f);
        parametersTable3.addCell(_createCell("Relative Grayvalue (Normalized to max) F32",
        false, 1, true));
        parametersTable3.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value6 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF32PAN", 10, "\n");
        parametersTable3.addCell(_createCell(value6.toString(), false, 1, true));
        Object value7 = _programObject.getValuesOfParameterAsString("radiusF32PAN", 10, "\n");
        parametersTable3.addCell(_createCell(value7.toString(), false, 1, true));

        PdfPTable parametersTable4 = new PdfPTable(2);
        parametersTable4.setSpacingBefore(20.0f);
        parametersTable4.addCell(_createCell("Relative Grayvalue (Normalized to max) F5.6",
        false, 1, true));
        parametersTable4.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value8 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF5.6PAN", 10, "\n");
        parametersTable4.addCell(_createCell(value8.toString(), false, 1, true));
        Object value9 = _programObject.getValuesOfParameterAsString("radiusF5.6PAN", 10,
        "\n");
        parametersTable4.addCell(_createCell(value9.toString(), false, 1, true));

        PdfPTable parametersTable5 = new PdfPTable(2);
        parametersTable5.setSpacingBefore(20.0f);
        parametersTable5.addCell(_createCell("Relative Grayvalue (Normalized to max) F8",
        false, 1, true));
        parametersTable5.addCell(_createCell("Radius [mm]", false, 1, true));
        Object value10 =
        _programObject.getValuesOfParameterAsString("relativeGrayvalueF8PAN", 10, "\n");
        parametersTable5.addCell(_createCell(value10.toString(), false, 1, true));
        Object value11 = _programObject.getValuesOfParameterAsString("radiusF8PAN", 10, "\n");
        parametersTable5.addCell(_createCell(value11.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(parametersTable2);
        _pdfDocument.add(parametersTable3);
        _pdfDocument.add(parametersTable4);
        _pdfDocument.add(parametersTable5);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page10() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Noise (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor noise shows image noise with respect to the
        image center measured at an aperture of "
        +_programObject.getFirstValueOfParameter("imageNoiseAperturePAN") + " with exposure
        time of " + _programObject.getFirstValueOfParameter("exposureTimePAN") + "msec.",
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Signal to Noise Ratio", _font14bold));
        _pdfDocument.add(new Paragraph("Corrected-NoCal", _font14));
```

```
        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Signal to Noise Ratio", false, 1, true));
        parametersTable.addCell(_createCell("Spectrometer-measured Radiance", false, 1,
        true));
        Object value =
        _programObject.getValuesOfParameterAsString("signalToNoiseRatioNoCalPAN", 15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 =
        _programObject.getValuesOfParameterAsString("spectrometerMeasuredRadianceNoCalPAN",
        15, "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);

        _pdfDocument.add(new Paragraph("Corrected-Cal", _font14));
        PdfPTable parametersTable1 = new PdfPTable(2);
        parametersTable1.setSpacingBefore(20.0f);
        parametersTable1.addCell(_createCell("Signal to Noise Ratio", false, 1, true));
        parametersTable1.addCell(_createCell("Spectrometer-measured Radiance", false, 1,
        true));
        Object value2 =
        _programObject.getValuesOfParameterAsString("signalToNoiseRatioCalPAN", 15, "\n");
        parametersTable1.addCell(_createCell(value2.toString(), false, 1, true));
        Object value3 =
        _programObject.getValuesOfParameterAsString("spectrometerMeasuredRadianceCalPAN",
        15, "\n");
        parametersTable1.addCell(_createCell(value3.toString(), false, 1, true));

        _pdfDocument.add(parametersTable1);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("This is a camera type specific calibration.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page9() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensor Linearity (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfLinearity") + " This
        is a camera type specific calibration.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The deviation from the linearity is below
        "+_programObject.getFirstValueOfParameter("deviationFromTheLinearityPAN") + "%.",
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("This is a camera type specific measurement.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page8() throws DocumentException {
        _pdfDocument.add(new Paragraph("Radiometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Sensitivity of " +
        _programObject.getFirstValueOfParameter("cameraHeadReference") + " camera
        (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("cameraName")+ " Relative Spectral
        Response", _font14bold));
```

```
        PdfPTable parametersTable = new PdfPTable(2);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Relative Spectral Response", false, 1, true));
        parametersTable.addCell(_createCell("Wavelength [nm]", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("relativeSpectralResponsePAN", 15, "\n");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("wavelengthPAN", 15,
        "\n");
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("descriptionOfSensitivity"),
        _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("This is a camera type specific measurement.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page7() throws DocumentException {
        _pdfDocument.add(new Paragraph("Optical System", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Modulation Transfer Function, MTF of " +
        _programObject.getFirstValueOfParameter("cameraHeadReference") + " Camera
        (Reference)", _font16));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph(
        _programObject.getFirstValueOfParameter("cameraName")+ " " +
        _programObject.getFirstValueOfParameter("cameraHeadReference") + "-MTF Polychromatic
        F/5.6; " + _programObject.getFirstValueOfParameter("temperatureStabilityPAN")+ "
        [mm]-Temperature Stability", _font14));

        PdfPTable table = new PdfPTable(2);
        table.setSpacingBefore(20.0f);
        table.addCell(_createCell("Modulation Transfer Function", false, 1, true));
        table.addCell(_createCell("Temperature", false, 1, true));
        Object value =
        _programObject.getValuesOfParameterAsString("modulationTransferFunctionPAN", 20,
        "\n");
        table.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getValuesOfParameterAsString("temperatureForMTFPAN",
        20, "\n");
        table.addCell(_createCell(value1.toString(), false, 1, true));

        _pdfDocument.add(table);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The MTF measurement is camera type specific and
        shows variation of the MTF within the specifed temperature range.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("This is a camera type specific measurement.",
        _font14));

        _pdfDocument.newPage();
    }

    private void _page6() throws DocumentException {
        _pdfDocument.add(new Paragraph("Geometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Image Residuals", _font16));
        _pdfDocument.add(Chunk.NEWLINE);

        _pdfDocument.add(new Paragraph("The geometric error remaining after stitching the
```

```
        multi camera-head images to one large image is "
        +_programObject.getFirstValueOfParameter("stitchingResiduals") + " microns" + " and
        the RMSE value is below " + _programObject.getFirstValueOfParameter("rmse")+ "
        microns.", _font14));
        _pdfDocument.newPage();
    }

    private void _page5() throws DocumentException {
        _pdfDocument.add(new Paragraph("Geometric Calibration", _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The output image geometry is based on the "
        +_programObject.getFirstValueOfParameter("cameraHeadReference") + " Camera head
        (reference head = master camera)."+ " All other camera heads are registered and
        aligned to this head.", _font14));
        _pdfDocument.add(new Paragraph("Aerial triangulation checks overall system
        performance based on.", _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Output image", _font16));

        ArrayList<Pair<PdfPCell, PdfPCell>> pairList = new ArrayList<>();
        pairList.add(_createPair("Reference Camera", "cameraHeadReference"));
        pairList.add(_createPair("Serial Number", "serialNumberReference"));
        pairList.add(_createPair("Number of rows [pixels]", "numberOfRows"));
        pairList.add(_createPair("Number of columns [pixels]", "numberOfColumns"));
        pairList.add(_createPair("Pixel Size X [µm]", "pixelSizeX"));
        pairList.add(_createPair("Pixel Size Y [µm]", "pixelSizeY"));
        pairList.add(_createPair("Image Size X [mm]", "imageSizeX"));
        pairList.add(_createPair("Image Size Y [mm]", "imageSizeY"));
        pairList.add(_createPair("Focal Length [mm]", "calibratedFocalLength"));
        pairList.add(_createPair("Quality of the calibrated focal length [+/- value in mm]",
        "qualityOfCalibratedFocalLengthOthers"));
        pairList.add(_createPair("Principal Point X [mm]", "princPointAutocollX"));
        pairList.add(_createPair("Principal Point Y [mm]", "princPointAutocollY"));
        pairList.add(_createPair("Covariance of the location of the principal point [ +/-
        value in mm]", "covPrincPtAutocollOthers"));

        PdfPTable table = _generatePairListTable(pairList, true, 70.0f, PdfPTable.ALIGN_LEFT);
        table.setSpacingBefore(20.0f);
        _pdfDocument.add(table);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("The geometric calibration takes place at " +
        _programObject.getFirstValueOfParameter("individualNameSD_Calibration") + " on a
        certified test stand.", _font14));
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("geometryCalibrationType"),
        _font14));

        _pdfDocument.newPage();
    }

    private void _page4() throws DocumentException {
        Paragraph headerParagraph = new Paragraph("Aerial triangulation statistic results:",
        _font20);
        headerParagraph.setAlignment(Paragraph.ALIGN_LEFT);

        PdfPTable table = new PdfPTable(4);
        table.setSpacingBefore(20.0f);

        table.addCell(_createCell("Parameter", false, 1, true));
        table.addCell(_createCell("X/Omega", false, 1, true));
        table.addCell(_createCell("Y/Phi", false, 1, true));
        table.addCell(_createCell("Z/Kappa", false, 1, true));

        PdfPCell pixelCell = _createCell("RMS Control", false, 1, true);
        pixelCell.setRowspan(1);
        table.addCell(pixelCell);
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsControlX"),
```

```
        false, 1, true));
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsControlY"),
        false, 1, true));
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsControlZ"),
        false, 1, true));

        PdfPCell pixelCell1 = _createCell("RMS Check", false, 1, true);
        pixelCell1.setRowspan(1);
        table.addCell(pixelCell1);
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsCheckX"),
        false, 1, true));
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsCheckY"),
        false, 1, true));
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsCheckZ"),
        false, 1, true));

        PdfPCell pixelCell2 = _createCell("RMS Limits", false, 1, true);
        pixelCell2.setRowspan(1);
        table.addCell(pixelCell2);
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsLimitsX"),
        false, 1, true));
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsLimitsY"),
        false, 1, true));
        table.addCell(_createCell( _programObject.getFirstValueOfParameter("rmsLimitsZ"),
        false, 1, true));

        PdfPCell pixelCell3 = _createCell("Max Grund Residual", false, 1, true);
        pixelCell3.setRowspan(1);
        table.addCell(pixelCell3);
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("maxGroundResidualX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("maxGroundResidualY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("maxGroundResidualZ"), false, 1, true));

        PdfPCell pixelCell4 = _createCell("Residual Limits", false, 1, true);
        pixelCell4.setRowspan(1);
        table.addCell(pixelCell4);

        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("residualLimitsX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("residualLimitsY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("residualLimitsZ"), false, 1, true));
        PdfPCell pixelCell5 = _createCell("Mean Std Dev Object", false, 1, true);
        pixelCell5.setRowspan(1);
        table.addCell(pixelCell5);

        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevObjectX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevObjectY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevObjectZ"), false, 1, true));
        PdfPCell pixelCell6 = _createCell("RMS Photo Position", false, 1, true);
        pixelCell6.setRowspan(1);
        table.addCell(pixelCell6);

        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("rmsPhotoPositionX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("rmsPhotoPositionY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("rmsPhotoPositionZ"), false, 1, true));
        PdfPCell pixelCell7 = _createCell("RMS Photo Attitude", false, 1, true);
```

```
        pixelCell7.setRowspan(1);
        table.addCell(pixelCell7);

        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("rmsPhotoAttitudeX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("rmsPhotoAttitudeY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("rmsPhotoAttitudeZ"), false, 1, true));

        PdfPCell pixelCell8 = _createCell("Mean Std Dev Photo Position", false, 1, true);
        pixelCell8.setRowspan(1);
        table.addCell(pixelCell8);
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevPhotoPositionX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevPhotoPositionY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevPhotoPositionZ"), false, 1, true));

        PdfPCell pixelCell9 = _createCell("Mean Std Dev Photo Attitude", false, 1, true);
        pixelCell9.setRowspan(1);
        table.addCell(pixelCell9);
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevPhotoAttitudeX"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevPhotoAttitudeY"), false, 1, true));
        table.addCell(_createCell(
        _programObject.getFirstValueOfParameter("meanStdDevPhotoAttitudeZ"), false, 1, true));



        Paragraph[] paragraphs = new Paragraph[] {
            new Paragraph("Current Count", _font14bold),
            new Paragraph("Control Points Used: " +
            _programObject.getFirstValueOfParameter("numberControlPoints"), _font14),
            new Paragraph("Check Points Used: " +
            _programObject.getFirstValueOfParameter("numberCheckPoints"), _font14),
            new Paragraph("Photos Used: " +
            _programObject.getFirstValueOfParameter("numberOfPhotosUsed"), _font14),
            new Paragraph("Photos Not Used: " +
            _programObject.getFirstValueOfParameter("photosNotUsed"), _font14),
            new Paragraph("Image Points Used: " +
            _programObject.getFirstValueOfParameter("imagePointsUsed"), _font14),
        };

        Paragraph[] paragraphsnext = new Paragraph[] {
            new Paragraph("Key Statistics", _font14bold),
            new Paragraph("Sigma [um]: " +
            _programObject.getFirstValueOfParameter("sigmaNaught"), _font14),
            new Paragraph("RMS Image (x) [µm]: " +
            _programObject.getFirstValueOfParameter("rmsImageX"), _font14),
            new Paragraph("RMS Image (y) [um]: " +
            _programObject.getFirstValueOfParameter("rmsImageY"), _font14),
            new Paragraph("Number of iteration: " +
            _programObject.getFirstValueOfParameter("numberOfIteration"), _font14),
            new Paragraph("Degrees of Freedom: " +
            _programObject.getFirstValueOfParameter("degreesOfFreedom"), _font14),
            new Paragraph("Gross Image Blunders: " +
            _programObject.getFirstValueOfParameter("grossImageBlunders"), _font14),
            new Paragraph("Gross Control Blunders: " +
            _programObject.getFirstValueOfParameter("grossControlBlunders"), _font14),
            new Paragraph("Image Blunders: " +
            _programObject.getFirstValueOfParameter("imageBlunders"), _font14),
            new Paragraph("Solution Status: " +
            _programObject.getFirstValueOfParameter("solutionStatus"), _font14),
        };
```

```
        Paragraph[] paragraphsnext1 = new Paragraph[] {
            new Paragraph("Project Settings", _font14bold),
            new Paragraph("Linear: " +
            _programObject.getFirstValueOfParameter("projectSettingsLinear"), _font14),
            new Paragraph("Angular: " +
            _programObject.getFirstValueOfParameter("projectSettingsAngular"), _font14),
            new Paragraph("Refraction: " +
            _programObject.getFirstValueOfParameter("projectSettingsRefraction"), _font14),
            new Paragraph("Curvature: " +
            _programObject.getFirstValueOfParameter("projectSettingsCurvature"), _font14),
            new Paragraph("Coordinate Reference System: " +
            _programObject.getFirstValueOfParameter("coordinateReferenceSystem"), _font14),
        };

        Paragraph[] paragraphsnext2 = new Paragraph[] {
            new Paragraph("The results of the aerial triangulation were generated with " +
            _programObject.getFirstValueOfParameter("software") + "The maximum RMS in check
            points is < " + _programObject.getFirstValueOfParameter("maxRMSX") + " GSD in x,
            < " + _programObject.getFirstValueOfParameter("maxRMSY") + " GSD in y and < " +
            _programObject.getFirstValueOfParameter("maxRMSZ") + " GSD in z.", _font14),
            new Paragraph("Aerial Triangulation performed by: " +
            _programObject.getFirstValueOfParameter("personResponsibleForAerialTriangulation")
            , _font14),
            new Paragraph("Date of Aerial Triangulation: " +
            _programObject.getFirstValueOfParameter("dateOfAerialTriangulation"), _font14)
        };

        _pdfDocument.add(headerParagraph);
        _pdfDocument.add(table);

        for (Paragraph paragraph : paragraphs) {
            _pdfDocument.add(paragraph);

        }
        _pdfDocument.add(Chunk.NEWLINE);

        for (Paragraph paragraph : paragraphsnext) {
            _pdfDocument.add(paragraph);

        }
        _pdfDocument.add(Chunk.NEWLINE);

        for (Paragraph paragraph : paragraphsnext1) {
            _pdfDocument.add(paragraph);
        }
        _pdfDocument.add(Chunk.NEWLINE);

        for (Paragraph paragraph : paragraphsnext2) {
            _pdfDocument.add(paragraph);
        }

        _pdfDocument.newPage();
    }

    private void _page3() throws DocumentException {
        _pdfDocument.add(new Paragraph("Camera Serial Numbers and Burn-In flight", _font20));

        PdfPTable parametersTable = new PdfPTable(3);
        parametersTable.setSpacingBefore(20.0f);
        parametersTable.addCell(_createCell("Camera Head", false, 1, true));
        parametersTable.addCell(_createCell("Serial number", false, 1, true));
        parametersTable.addCell(_createCell("Calib. Date", false, 1, true));

        Object value = _programObject.getFirstValueOfParameter("cameraHeadReference");
        parametersTable.addCell(_createCell(value.toString(), false, 1, true));
        Object value1 = _programObject.getFirstValueOfParameter("serialNumberReference");
```

```
        parametersTable.addCell(_createCell(value1.toString(), false, 1, true));
        Object value2 =
        _programObject.getFirstValueOfParameter("calibrationDateCameraHeadReference");
        parametersTable.addCell(_createCell(value2.toString(), false, 1, true));

        Object value3 = _programObject.getFirstValueOfParameter("cameraHead1");
        parametersTable.addCell(_createCell(value3.toString(), false, 1, true));
        Object value4 = _programObject.getFirstValueOfParameter("serialNumberCameraHead1");
        parametersTable.addCell(_createCell(value4.toString(), false, 1, true));
        Object value5 = _programObject.getFirstValueOfParameter("calibrationDateCameraHead1");
        parametersTable.addCell(_createCell(value5.toString(), false, 1, true));

        Object value6 = _programObject.getFirstValueOfParameter("cameraHead2");
        parametersTable.addCell(_createCell(value6.toString(), false, 1, true));
        Object value7 = _programObject.getFirstValueOfParameter("serialNumberCameraHead2");
        parametersTable.addCell(_createCell(value7.toString(), false, 1, true));
        Object value8 = _programObject.getFirstValueOfParameter("calibrationDateCameraHead2");
        parametersTable.addCell(_createCell(value8.toString(), false, 1, true));

        Object value9 = _programObject.getFirstValueOfParameter("cameraHead3");
        parametersTable.addCell(_createCell(value9.toString(), false, 1, true));
        Object value10 = _programObject.getFirstValueOfParameter("serialNumberCameraHead3");
        parametersTable.addCell(_createCell(value10.toString(), false, 1, true));
        Object value11 =
        _programObject.getFirstValueOfParameter("calibrationDateCameraHead3");
        parametersTable.addCell(_createCell(value11.toString(), false, 1, true));

        Object value12 = _programObject.getFirstValueOfParameter("cameraHead4");
        parametersTable.addCell(_createCell(value12.toString(), false, 1, true));
        Object value13 = _programObject.getFirstValueOfParameter("serialNumberCameraHead4");
        parametersTable.addCell(_createCell(value13.toString(), false, 1, true));
        Object value14 =
        _programObject.getFirstValueOfParameter("calibrationDateCameraHead4");
        parametersTable.addCell(_createCell(value14.toString(), false, 1, true));

        _pdfDocument.add(parametersTable);
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Burn-In flight performed: " +
        _programObject.getFirstValueOfParameter("calibrationDate"), _font20));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new Paragraph("Test block configuration", _font20));

        ArrayList<Pair<PdfPCell, PdfPCell>> pairList = new ArrayList<>();
        pairList.add(_createPair("Photo Scale", "photoScale"));
        pairList.add(_createPair("Flying Height [m]", "flyingHeight"));
        pairList.add(_createPair("Flying Altitude [m]", "flyingAltitudeAboveGround"));
        pairList.add(_createPair("Run-Spacing [m]", "run-Spacing"));
        pairList.add(_createPair("Base-Length [m]", "base"));;
        pairList.add(_createPair("Number of Exposures", "numberOfPhotos"));
        pairList.add(_createPair("Side-lap [%]", "alongStripOverlap"));
        pairList.add(_createPair("End-lap [%]", "acrossStripOverlap"));
        pairList.add(_createPair("Terrain Height [m]", "terrainHeight"));
        pairList.add(_createPair("Number of strips", "numberOfStrips"));
        pairList.add(_createPair("Photos in one strip (N-S)", "numberOfPhotosAlongStripNS"));
        pairList.add(_createPair("Photos in one strip (W-E)", "numberOfPhotosAlongStripWE"));
        pairList.add(_createPair("Photos Used", "numberOfPhotosUsed"));
        pairList.add(_createPair("Control Point Used", "numberControlPoints"));
        pairList.add(_createPair("Check Points Used", "numberCheckPoints"));
        pairList.add(_createPair("GSD [cm]", "groundSamplingDistance"));
        PdfPTable table = _generatePairListTable(pairList, true, 50.0f, PdfPTable.ALIGN_LEFT);
        table.setSpacingBefore(20.0f);

        _pdfDocument.add(table);

        _pdfDocument.newPage();
    }
```

```
    private void _page2() throws DocumentException {
        ArrayList<Pair<PdfPCell, PdfPCell>> pairList = new ArrayList<>();
        pairList.add(_createPair("Camera", "cameraName"));
        pairList.add(_createPair("Manufacturer", "manufacturer"));
        pairList.add(_createPair("Manufacturer's city", "manufacturersCity"));
        pairList.add(_createPair("Manufacturer's country", "manufacturersCountry"));
        pairList.add(_createPair("Reference", "cameraHeadReference"));
        pairList.add(_createPair("Serial Number", "serialNumberReference"));
        pairList.add(_createPair("Date of Calibration", "calibrationDate"));
        pairList.add(_createPair("Date of Report", "dateOfReport"));

        PdfPTable table = _generatePairListTable(pairList, false, 100.0f,
        PdfPTable.ALIGN_CENTER);

        _pdfDocument.add(table);
        _pdfDocument.add(_separator);
        _pdfDocument.add(new Paragraph("Calibration performed at: " +
        _programObject.getFirstValueOfParameter("individualNameSD_Calibration") + ", " +
        _programObject.getFirstValueOfParameter("deliveryPointSD_Calibration") + ", "  +
        _programObject.getFirstValueOfParameter("postalCodeSD_Calibration") + ", " +
        _programObject.getFirstValueOfParameter("citySD_Calibration")+ " " +
        _programObject.getFirstValueOfParameter("countrySD_Calibration"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);
        _pdfDocument.add(new
        Paragraph(_programObject.getFirstValueOfParameter("calibrationResult"), _font14));
        _pdfDocument.add(Chunk.NEWLINE);

        PdfPTable datesTable = new PdfPTable(2);
        datesTable.setWidthPercentage(100.0f);
        datesTable.addCell(_createCell("Date of Calibration: " +
        _programObject.getFirstValueOfParameter("calibrationDate"), false, 1, false));
        datesTable.addCell(_createCell("Date of Certification: " +
        _programObject.getFirstValueOfParameter("dateOfCertification"), false, 1, false));
        PdfPCell calibrationResponsibilityCell =
        _createCell("personResponsibleForCalibration", true, 1, false);
        calibrationResponsibilityCell.setPaddingTop(100.0f);
        datesTable.addCell(calibrationResponsibilityCell);
        PdfPCell certificationResponsibilityCell =
        _createCell("personResponsibleForCertification", true, 1, false);
        certificationResponsibilityCell.setPaddingTop(100.0f);
        datesTable.addCell(certificationResponsibilityCell);

        _pdfDocument.add(datesTable);
        _pdfDocument.add(_separator);

        _pdfDocument.newPage();
    }

    private void _page1() throws DocumentException {
        Paragraph mainPageHeaderParagraph = new Paragraph("Calibration Protocol\n", _font16);
        mainPageHeaderParagraph.setAlignment(Paragraph.ALIGN_CENTER);

        Paragraph mainPageTitleParagraph = new Paragraph("Camera Calibration Certificate\n",
        _font20bold);
        mainPageTitleParagraph.setAlignment(Paragraph.ALIGN_CENTER);
        mainPageTitleParagraph.setSpacingBefore(250.0f);

        Paragraph mainPageNoParagraph = new Paragraph("No: " +
        _programObject.getFirstValueOfParameter("cameraName"), _font20bold);
        mainPageNoParagraph.setAlignment(Paragraph.ALIGN_CENTER);
        mainPageNoParagraph.setSpacingAfter(150.0f);

        Paragraph[] mainPageCustomerParagraphs = new Paragraph[] {
            new Paragraph("For", _font14),
            new Paragraph(_programObject.getFirstValueOfParameter("customerName"),
            _font16bold),
            new Paragraph(_programObject.getFirstValueOfParameter("customerAddress"),
```

```
            _font14),
            new Paragraph(_programObject.getFirstValueOfParameter("customerCity"), _font14),
            new Paragraph(_programObject.getFirstValueOfParameter("customerCountry"), _font14)
        };

        _pdfDocument.add(mainPageHeaderParagraph);
        _pdfDocument.add(mainPageTitleParagraph);
        _pdfDocument.add(mainPageNoParagraph);

        for (Paragraph paragraph : mainPageCustomerParagraphs) {
            paragraph.setAlignment(Paragraph.ALIGN_CENTER);
            _pdfDocument.add(paragraph);
        }

        _pdfDocument.newPage();
    }

    private final Program _programObject;
    private final com.itextpdf.text.Document _pdfDocument;
    private final Font _font20bold;
    private final Font _font20;
    private final Font _font16bold;
    private final Font _font16;
    private final Font _font14;
    private final Font _font14bold;
    private final Font _font13;

    private final Chunk _separator = new Chunk(new LineSeparator());

    private final String _font = BaseFont.HELVETICA;
    private final String _boldFont = BaseFont.HELVETICA_BOLD;
    private final String _encoding = BaseFont.CP1257;
}
```

Anhang D
Die Quelltextdatei des Softwareprogramms: FileContents.java

```
package report_generator;

public class FileContents {
    public static String getMainFileContent() {
        return
"<?xml version=\"1.0\" encoding=\"UTF-8\"?>\n" +
"<Norm xmlns=\"http://example.com/ISO19159-1\"\n" +
"                       xmlns:gml=\"http://www.opengis.net/gml/3.2\" \n" +
"                        xmlns:xsi=\"http://www.w3.org/2001/XMLSchema-instance\"\n" +
"                       xsi:schemaLocation=\"http://example.com/ISO19159-1
ISO19159-1.xsd\"\n" +
"                       gml:id=\"GML_7b1a5a6f-ddad-4c3d-a507-3eb9ee0a8e68\">\n" +
"   <CA_2DReflectanceTarget>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>\n" +
"       <lampType>type of illumination used</lampType>\n" +
"       <atmosphericConditionCA_RadiometryInFlight>state of the
atmosphere</atmosphericConditionCA_RadiometryInFlight>\n" +
"       <aerosolQuantity>0.0</aerosolQuantity>\n" +
"       <numberPoints>0</numberPoints>\n" +
"       <controlPointCA_RadiometryTestRange>0.0</controlPointCA_RadiometryTestRange>\n" +
"       <expanse uom=\"#m\">0.0</expanse>\n" +
"       <minimumElevationCA_RadiometryTestRange
uom=\"#m\">0.0</minimumElevationCA_RadiometryTestRange> \n" +
"       <maximumElevationCA_RadiometryTestRange
uom=\"#m\">0.0</maximumElevationCA_RadiometryTestRange>\n" +
"       <averageElevationCA_RadiometryTestRange
uom=\"#m\">0.0</averageElevationCA_RadiometryTestRange>     \n" +
"       <linearSize uom=\"#m\">0.0</linearSize>\n" +
"       <targetExpanse uom=\"#m\">0.0</targetExpanse>\n" +
"       <shapeCA_2DReflectanceTarget>square</shapeCA_2DReflectanceTarget>\n" +
"       <material>awning</material>\n" +
"       <spectralCharacteristicsCA_2DReflectanceTarget>\n" +
"           <CA_SpectrumCA_2DReflectanceTarget>\n" +
"               <numberBandsCA_2DReflectanceTarget>0</numberBandsCA_2DReflectanceTarget>\n" +
"               <wavelengthCA_SpectrumCA_2DReflectanceTarget
uom=\"#m\">0.0</wavelengthCA_SpectrumCA_2DReflectanceTarget>\n" +
"               <responseCA_2DReflectanceTarget>0.0</responseCA_2DReflectanceTarget>\n" +
"           </CA_SpectrumCA_2DReflectanceTarget>\n" +
"       </spectralCharacteristicsCA_2DReflectanceTarget>\n" +
"       <measuredReflectance>\n" +
"           <CA_MeasuredReflectance>\n" +
"               <intensity>0.0</intensity>\n" +
"               <wavelengthCA_MeasuredReflectance
uom=\"#m\">0.0</wavelengthCA_MeasuredReflectance>\n" +
"               <zenithAngle uom=\"#m\">0.0</zenithAngle>\n" +
"               <azimuth uom=\"#m\">0.0</azimuth>\n" +
"           </CA_MeasuredReflectance>\n" +
"       </measuredReflectance>\n" +
"       <minimumNominalReflectance>0.0</minimumNominalReflectance>\n" +
"       <maximumNominalReflectance>0.0</maximumNominalReflectance>\n" +
"       <radiometricStability>description of the radiometric stability of the
target</radiometricStability>\n" +
"       <cleanness>description of the cleanness of the target</cleanness>\n" +
"       <absoluteAccuracy>0.0</absoluteAccuracy>\n" +
"   </CA_2DReflectanceTarget>\n" +
"   <CA_AffineDistortion>   \n" +
"       <a1>0.0</a1>\n" +
"       <a2>0.0</a2>\n" +
"   </CA_AffineDistortion>\n" +
"   <CA_AffineFraserDistortion>\n" +
"       <f1>0.0</f1>\n" +
"       <f2>0.0</f2>\n" +
"   </CA_AffineFraserDistortion>\n" +
```

```
"   <CA_AirforcePattern>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <sizeCA_AirforcePattern uom=\"#m\">0.0</sizeCA_AirforcePattern>\n" +
"       <descriptionCA_AirforcePattern>free text description of the
target</descriptionCA_AirforcePattern>\n" +
"       <typeCA_AirforcePattern>airforcePattern</typeCA_AirforcePattern>\n" +
"       <materialCA_AirforcePattern>awning</materialCA_AirforcePattern>\n" +
"       <paintTypeCA_AirforcePattern>characteristics of the
paint</paintTypeCA_AirforcePattern>\n" +
"       <reflectancePropertiesCA_AirforcePattern>peculiarity of the
reflectance</reflectancePropertiesCA_AirforcePattern>\n" +
"       <minimumBarWidth uom=\"#m\">0.0</minimumBarWidth>\n" +
"       <maximumBarWidth uom=\"#m\">0.0</maximumBarWidth>\n" +
"       <numberOfBarsInBox>1</numberOfBarsInBox>\n" +
"       <numberOfBoxes>1</numberOfBoxes>\n" +
"   </CA_AirforcePattern>\n" +
"   <CA_AuxiliaryDevice>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>\n" +
"       <geometryCalibrationType>more detailed explanation of the the calibration
type</geometryCalibrationType>\n" +
"       <synchronizationCA_AuxiliaryDevice>0-0-0
00:00:00</synchronizationCA_AuxiliaryDevice>\n" +
"       <synchronizationErrorCA_AuxiliaryDevice>0-0-0
00:00:00</synchronizationErrorCA_AuxiliaryDevice>\n" +
"       <referenceTemperatureCA_AuxiliaryDevice>\n" +
"           <CA_TemperatureCA_AuxiliaryDevice>\n" +
"               <temperatureCA_AuxiliaryDevice>0.0</temperatureCA_AuxiliaryDevice>\n" +
"           </CA_TemperatureCA_AuxiliaryDevice>\n" +
"       </referenceTemperatureCA_AuxiliaryDevice>\n" +
"       <versionFirmwareCA_AuxiliaryDevice>note about the firmware
version</versionFirmwareCA_AuxiliaryDevice>\n" +
"       <versionHardwareCA_AuxiliaryDevice>note about the hardware
version</versionHardwareCA_AuxiliaryDevice>\n" +
"       <timeLeverarmCA_AuxiliaryDevice>0-0-0 00:00:00</timeLeverarmCA_AuxiliaryDevice>\n" +
"       <leverarmCA_AuxiliaryDevice>0.0</leverarmCA_AuxiliaryDevice>\n" +
"       <errorLeverarmCA_AuxiliaryDevice uom=\"#m\">0.0</errorLeverarmCA_AuxiliaryDevice>\n" +
"   </CA_AuxiliaryDevice>\n" +
"   <CA_CalibrationValidation>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"   </CA_CalibrationValidation>\n" +
"   <CA_DecenteringDistortion>\n" +
"       <p1>0.0</p1>\n" +
"       <p2>0.0</p2>\n" +
"   </CA_DecenteringDistortion>\n" +
"   <CA_DefectPixels>\n" +
"       <row>0</row>\n" +
"       <column>0</column>\n" +
"   </CA_DefectPixels>\n" +
"   <CA_Detector>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
```

```
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                        <dateCA_RadiometryInSensor>\n" +
"                            <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                            </CI_DateCA_RadiometryInSensor>\n" +
"                        </dateCA_RadiometryInSensor>\n" +
"                        <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                        <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                        </editionDateCA_RadiometryInSensor>\n" +
"                        <identifierCA_RadiometryInSensor>\n" +
"                            <MD_IdentifierCA_RadiometryInSensor>\n" +
"                                <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                                <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                            </MD_IdentifierCA_RadiometryInSensor>\n" +
"                        </identifierCA_RadiometryInSensor>\n" +
"                        <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                            <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                                <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                                <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                                <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                                <contactInfoCA_RadiometryInSensor>\n" +
"                                    <CI_ContactCA_RadiometryInSensor>\n" +
"                                        <phoneCA_RadiometryInSensor>\n" +
"                                            <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                                <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                                <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
```

```
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
```

```
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"        <detectorIdentification>\n" +
"            <MD_IdentificationCA_Detector>\n" +
"                <citationCA_Detector>\n" +
"                    <CI_CitationCA_Detector>\n" +
```

```
"                        <titleCA_Detector>name by which the cited resource is
known</titleCA_Detector>\n" +
"                        <alternateTitleCA_Detector>short name or other language name by
which the cited information is known</alternateTitleCA_Detector>\n" +
"                        <dateCA_Detector>\n" +
"                            <CI_DateCA_Detector>\n" +
"
<dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>\n" +
"                                <dateTypeCA_Detector>creation</dateTypeCA_Detector>\n" +
"                            </CI_DateCA_Detector>\n" +
"                        </dateCA_Detector>\n" +
"                        <editionCA_Detector>version of the cited
resource</editionCA_Detector>\n" +
"                        <editionDateCA_Detector>\n" +
"
<dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>\n" +
"                        </editionDateCA_Detector>\n" +
"                        <identifierCA_Detector>\n" +
"                            <MD_IdentifierCA_Detector>\n" +
"                                <authorityCA_Detector>person or party responsible for
maintenance of the namespace</authorityCA_Detector>\n" +
"                                <codeCA_Detector>alphanumeric value identifying an instance
in the namespace</codeCA_Detector>\n" +
"                            </MD_IdentifierCA_Detector>\n" +
"                        </identifierCA_Detector>\n" +
"                        <citedResponsiblePartyCA_Detector>\n" +
"                            <CI_ResponsiblePartyCA_Detector>\n" +
"                                <individualNameCA_Detector>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector>\n" +
"                                <organisationNameCA_Detector>name of the responsible
organization</organisationNameCA_Detector>\n" +
"                                <positionNameCA_Detector>role or position of the responsible
person</positionNameCA_Detector>\n" +
"                                <contactInfoCA_Detector>\n" +
"                                    <CI_ContactCA_Detector>\n" +
"                                        <phoneCA_Detector>\n" +
"                                            <CI_TelephoneCA_Detector>\n" +
"                                                <voiceCA_Detector>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector>\n" +
"                                                <facsimileCA_Detector>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector>\n" +
"                                            </CI_TelephoneCA_Detector>\n" +
"                                        </phoneCA_Detector>\n" +
"                                        <addressCA_Detector>\n" +
"                                            <CI_AddressCA_Detector>\n" +
"                                                <deliveryPointCA_Detector>address line for
the location</deliveryPointCA_Detector>\n" +
"                                                <cityCA_Detector>city of the
location</cityCA_Detector>\n" +
"                                                <administrativeAreaCA_Detector>state,
province of the location</administrativeAreaCA_Detector>\n" +
"                                                <postalCodeCA_Detector>ZIP or other postal
code</postalCodeCA_Detector>\n" +
"                                                <countryCA_Detector>country of the physical
address</countryCA_Detector>\n" +
"                                                <electronicMailAddressCA_Detector>telephone
number of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector>\n" +
"                                            </CI_AddressCA_Detector>\n" +
"                                        </addressCA_Detector>\n" +
"                                        <onlineResourceCA_Detector>\n" +
"                                            <CI_OnlineResourceCA_Detector>\n" +
"                                                <linkageCA_Detector>location (address) for
on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector>\n" +
"                                                <protocolCA_Detector>connection protocol to
be used</protocolCA_Detector>\n" +
```

```
"                                                <applicationProfileCA_Detector>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector>\n" +
"                                                <nameCI_OnlineResourceCA_Detector>name of
the online resource</nameCI_OnlineResourceCA_Detector>\n" +
"
<descriptionCI_OnlineResourceCA_Detector>detailed text description of what the online
resource is/does</descriptionCI_OnlineResourceCA_Detector>\n" +
"
<functionCA_Detector>download</functionCA_Detector>\n" +
"                                            </CI_OnlineResourceCA_Detector>\n" +
"                                        </onlineResourceCA_Detector>\n" +
"                                        <hoursOfServiceCA_Detector>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector>\n" +
"                                        <contactInstructionsCA_Detector>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_Detector>\n" +
"                                    </CI_ContactCA_Detector>\n" +
"                                </contactInfoCA_Detector>\n" +
"                                <roleCA_Detector>resourceProvider</roleCA_Detector>\n" +
"                            </CI_ResponsiblePartyCA_Detector>\n" +
"                        </citedResponsiblePartyCA_Detector>\n" +
"
<presentationFormCA_Detector>documentDigital</presentationFormCA_Detector>\n" +
"                        <seriesCA_Detector>\n" +
"                            <CI_SeriesCA_Detector>\n" +
"                                <nameCI_SeriesCA_Detector>name of the series, or aggregate
dataset, of which the dataset is a part</nameCI_SeriesCA_Detector>\n" +
"                                <issueIdentificationCA_Detector>information identifying the
issue of the series</issueIdentificationCA_Detector>\n" +
"                                <pageCA_Detector>details on which pages of the publication
the article was published</pageCA_Detector>\n" +
"                            </CI_SeriesCA_Detector>\n" +
"                        </seriesCA_Detector>\n" +
"                        <otherCitationDetailsCA_Detector>other information required to
complete the citation that is not recorded elsewhere</otherCitationDetailsCA_Detector>\n" +
"                        <collectiveTitleCA_Detector>common title with holdings
note</collectiveTitleCA_Detector>\n" +
"                        <ISBNCA_Detector>international Standard Book
Number</ISBNCA_Detector>\n" +
"                        <ISSNCA_Detector>international Standard Serial
Number</ISSNCA_Detector>\n" +
"                    </CI_CitationCA_Detector>\n" +
"                </citationCA_Detector>\n" +
"                <abstractCA_Detector>brief narrative summary of the content of the
resource(s)</abstractCA_Detector>\n" +
"                <purposeCA_Detector>summary of the intentions with which the resource(s) was
developed</purposeCA_Detector>\n" +
"                <creditCA_Detector>recognition of those who contributed to the
resource(s)</creditCA_Detector>\n" +
"                <statusCA_Detector>completed</statusCA_Detector>\n" +
"                <pointOfContactCA_Detector>\n" +
"                    <CI_ResponsiblePartyCA_Detector1>\n" +
"                        <individualNameCA_Detector1>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector1>\n" +
"                        <organisationNameCA_Detector1>name of the responsible
organization</organisationNameCA_Detector1>\n" +
"                        <positionNameCA_Detector1>role or position of the responsible
person</positionNameCA_Detector1>\n" +
"                        <contactInfoCA_Detector1>\n" +
"                            <CI_ContactCA_Detector1>\n" +
"                                <phoneCA_Detector1>\n" +
"                                    <CI_TelephoneCA_Detector1>\n" +
"                                        <voiceCA_Detector1>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector1>\n" +
"                                        <facsimileCA_Detector1>telephone number of a
```

```
facsimile machine for the responsible organization or individual</facsimileCA_Detector1>\n" +
"                                    </CI_TelephoneCA_Detector1>\n" +
"                                </phoneCA_Detector1>\n" +
"                                <addressCA_Detector1>\n" +
"                                    <CI_AddressCA_Detector1>\n" +
"                                        <deliveryPointCA_Detector1>address line for the
location</deliveryPointCA_Detector1>\n" +
"                                        <cityCA_Detector1>city of the
location</cityCA_Detector1>\n" +
"                                        <administrativeAreaCA_Detector1>state, province of
the location</administrativeAreaCA_Detector1>\n" +
"                                        <postalCodeCA_Detector1>ZIP or other postal
code</postalCodeCA_Detector1>\n" +
"                                        <countryCA_Detector1>country of the physical
address</countryCA_Detector1>\n" +
"                                        <electronicMailAddressCA_Detector1>telephone number
of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector1>\n" +
"                                    </CI_AddressCA_Detector1>\n" +
"                                </addressCA_Detector1>\n" +
"                                <onlineResourceCA_Detector1>\n" +
"                                    <CI_OnlineResourceCA_Detector1>\n" +
"                                        <linkageCA_Detector1>location (address) for on-line
access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector1>\n" +
"                                        <protocolCA_Detector1>connection protocol to be
used</protocolCA_Detector1>\n" +
"                                        <applicationProfileCA_Detector1>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector1>\n" +
"                                        <nameCI_OnlineResourceCA_Detector1>name of the
online resource</nameCI_OnlineResourceCA_Detector1>\n" +
"                                        <descriptionCI_OnlineResourceCA_Detector1>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceCA_Detector1>\n" +
"
<functionCA_Detector1>download</functionCA_Detector1>\n" +
"                                    </CI_OnlineResourceCA_Detector1>\n" +
"                                </onlineResourceCA_Detector1>\n" +
"                                <hoursOfServiceCA_Detector1>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector1>\n" +
"                                <contactInstructionsCA_Detector1>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsCA_Detector1>\n" +
"                            </CI_ContactCA_Detector1>\n" +
"                        </contactInfoCA_Detector1>\n" +
"                        <roleCA_Detector1>resourceProvider</roleCA_Detector1>\n" +
"                    </CI_ResponsiblePartyCA_Detector1>\n" +
"                </pointOfContactCA_Detector>\n" +
"            </MD_IdentificationCA_Detector>\n" +
"        </detectorIdentification>\n" +
"    </CA_Detector>\n" +
"    <CA_DetectorDemands>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <case>1</case>\n" +
"        <numberOfPieces>0</numberOfPieces>\n" +
"        <gain>0.0</gain>\n" +
"        <offset>0.0</offset>\n" +
"        <signOfGain>1</signOfGain>\n" +
"        <minWavelength>0.0</minWavelength>\n" +
"        <maxWavelength>0.0</maxWavelength>\n" +
"        <b>0.0</b>\n" +
"        <c>0.0</c>\n" +
"        <sensorSystemIdentification>\n" +
"            <MD_IdentificationCA_RadiometryInSensor>\n" +
"                <citationCA_RadiometryInSensor>\n" +
```

```
"                    <CI_CitationCA_RadiometryInSensor>\n" +
"                        <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                        <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                        <dateCA_RadiometryInSensor>\n" +
"                            <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                            </CI_DateCA_RadiometryInSensor>\n" +
"                        </dateCA_RadiometryInSensor>\n" +
"                        <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                        <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                        </editionDateCA_RadiometryInSensor>\n" +
"                        <identifierCA_RadiometryInSensor>\n" +
"                            <MD_IdentifierCA_RadiometryInSensor>\n" +
"                                <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                                <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                            </MD_IdentifierCA_RadiometryInSensor>\n" +
"                        </identifierCA_RadiometryInSensor>\n" +
"                        <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                            <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                                <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                                <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                                <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                                <contactInfoCA_RadiometryInSensor>\n" +
"                                    <CI_ContactCA_RadiometryInSensor>\n" +
"                                        <phoneCA_RadiometryInSensor>\n" +
"                                            <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                                <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                                <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
```

```
"                                          <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                              <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                              <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                          </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                      </onlineResourceCA_RadiometryInSensor>\n" +
"                                      <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                  </CI_ContactCA_RadiometryInSensor>\n" +
"                              </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                          </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                      </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                      <seriesCA_RadiometryInSensor>\n" +
"                          <CI_SeriesCA_RadiometryInSensor>\n" +
"                              <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                              <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                              <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                          </CI_SeriesCA_RadiometryInSensor>\n" +
"                      </seriesCA_RadiometryInSensor>\n" +
"                      <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                      <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                      <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                      <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                  </CI_CitationCA_RadiometryInSensor>\n" +
"              </citationCA_RadiometryInSensor>\n" +
"              <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"              <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"              <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"              <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"              <pointOfContactCA_RadiometryInSensor>\n" +
"                  <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                      <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
```

```
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
```

```
"       <detectorIdentification>\n" +
"           <MD_IdentificationCA_Detector>\n" +
"               <citationCA_Detector>\n" +
"                   <CI_CitationCA_Detector>\n" +
"                       <titleCA_Detector>name by which the cited resource is
known</titleCA_Detector>\n" +
"                       <alternateTitleCA_Detector>short name or other language name by
which the cited information is known</alternateTitleCA_Detector>\n" +
"                       <dateCA_Detector>\n" +
"                           <CI_DateCA_Detector>\n" +
"
<dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>\n" +
"                               <dateTypeCA_Detector>creation</dateTypeCA_Detector>\n" +
"                           </CI_DateCA_Detector>\n" +
"                       </dateCA_Detector>\n" +
"                       <editionCA_Detector>version of the cited
resource</editionCA_Detector>\n" +
"                       <editionDateCA_Detector>\n" +
"
<dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>\n" +
"                       </editionDateCA_Detector>\n" +
"                       <identifierCA_Detector>\n" +
"                           <MD_IdentifierCA_Detector>\n" +
"                               <authorityCA_Detector>person or party responsible for
maintenance of the namespace</authorityCA_Detector>\n" +
"                               <codeCA_Detector>alphanumeric value identifying an instance
in the namespace</codeCA_Detector>\n" +
"                           </MD_IdentifierCA_Detector>\n" +
"                       </identifierCA_Detector>\n" +
"                       <citedResponsiblePartyCA_Detector>\n" +
"                           <CI_ResponsiblePartyCA_Detector>\n" +
"                               <individualNameCA_Detector>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector>\n" +
"                               <organisationNameCA_Detector>name of the responsible
organization</organisationNameCA_Detector>\n" +
"                               <positionNameCA_Detector>role or position of the responsible
person</positionNameCA_Detector>\n" +
"                               <contactInfoCA_Detector>\n" +
"                                   <CI_ContactCA_Detector>\n" +
"                                       <phoneCA_Detector>\n" +
"                                           <CI_TelephoneCA_Detector>\n" +
"                                               <voiceCA_Detector>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector>\n" +
"                                               <facsimileCA_Detector>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector>\n" +
"                                           </CI_TelephoneCA_Detector>\n" +
"                                       </phoneCA_Detector>\n" +
"                                       <addressCA_Detector>\n" +
"                                           <CI_AddressCA_Detector>\n" +
"                                               <deliveryPointCA_Detector>address line for
the location</deliveryPointCA_Detector>\n" +
"                                               <cityCA_Detector>city of the
location</cityCA_Detector>\n" +
"                                               <administrativeAreaCA_Detector>state,
province of the location</administrativeAreaCA_Detector>\n" +
"                                               <postalCodeCA_Detector>ZIP or other postal
code</postalCodeCA_Detector>\n" +
"                                               <countryCA_Detector>country of the physical
address</countryCA_Detector>\n" +
"                                               <electronicMailAddressCA_Detector>telephone
number of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector>\n" +
"                                           </CI_AddressCA_Detector>\n" +
"                                       </addressCA_Detector>\n" +
"                                       <onlineResourceCA_Detector>\n" +
"                                           <CI_OnlineResourceCA_Detector>\n" +
"                                               <linkageCA_Detector>location (address) for
```

```
on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector>\n" +
"                                                <protocolCA_Detector>connection protocol to
be used</protocolCA_Detector>\n" +
"                                                <applicationProfileCA_Detector>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector>\n" +
"                                                <nameCI_OnlineResourceCA_Detector>name of
the online resource</nameCI_OnlineResourceCA_Detector>\n" +
"
<descriptionCI_OnlineResourceCA_Detector>detailed text description of what the online
resource is/does</descriptionCI_OnlineResourceCA_Detector>\n" +
"
<functionCA_Detector>download</functionCA_Detector>\n" +
"                                            </CI_OnlineResourceCA_Detector>\n" +
"                                        </onlineResourceCA_Detector>\n" +
"                                        <hoursOfServiceCA_Detector>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector>\n" +
"                                        <contactInstructionsCA_Detector>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_Detector>\n" +
"                                    </CI_ContactCA_Detector>\n" +
"                                </contactInfoCA_Detector>\n" +
"                                <roleCA_Detector>resourceProvider</roleCA_Detector>\n" +
"                            </CI_ResponsiblePartyCA_Detector>\n" +
"                        </citedResponsiblePartyCA_Detector>\n" +
"
<presentationFormCA_Detector>documentDigital</presentationFormCA_Detector>\n" +
"                        <seriesCA_Detector>\n" +
"                            <CI_SeriesCA_Detector>\n" +
"                                <nameCI_SeriesCA_Detector>name of the series, or aggregate
dataset, of which the dataset is a part</nameCI_SeriesCA_Detector>\n" +
"                                <issueIdentificationCA_Detector>information identifying the
issue of the series</issueIdentificationCA_Detector>\n" +
"                                <pageCA_Detector>details on which pages of the publication
the article was published</pageCA_Detector>\n" +
"                            </CI_SeriesCA_Detector>\n" +
"                        </seriesCA_Detector>\n" +
"                        <otherCitationDetailsCA_Detector>other information required to
complete the citation that is not recorded elsewhere</otherCitationDetailsCA_Detector>\n" +
"                        <collectiveTitleCA_Detector>common title with holdings
note</collectiveTitleCA_Detector>\n" +
"                        <ISBNCA_Detector>international Standard Book
Number</ISBNCA_Detector>\n" +
"                        <ISSNCA_Detector>international Standard Serial
Number</ISSNCA_Detector>\n" +
"                    </CI_CitationCA_Detector>\n" +
"                </citationCA_Detector>\n" +
"                <abstractCA_Detector>brief narrative summary of the content of the
resource(s)</abstractCA_Detector>\n" +
"                <purposeCA_Detector>summary of the intentions with which the resource(s) was
developed</purposeCA_Detector>\n" +
"                <creditCA_Detector>recognition of those who contributed to the
resource(s)</creditCA_Detector>\n" +
"                <statusCA_Detector>completed</statusCA_Detector>\n" +
"                <pointOfContactCA_Detector>\n" +
"                    <CI_ResponsiblePartyCA_Detector1>\n" +
"                        <individualNameCA_Detector1>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector1>\n" +
"                        <organisationNameCA_Detector1>name of the responsible
organization</organisationNameCA_Detector1>\n" +
"                        <positionNameCA_Detector1>role or position of the responsible
person</positionNameCA_Detector1>\n" +
"                        <contactInfoCA_Detector1>\n" +
"                            <CI_ContactCA_Detector1>\n" +
"                                <phoneCA_Detector1>\n" +
```

```
"                                    <CI_TelephoneCA_Detector1>\n" +
"                                        <voiceCA_Detector1>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector1>\n" +
"                                        <facsimileCA_Detector1>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector1>\n" +
"                                    </CI_TelephoneCA_Detector1>\n" +
"                                </phoneCA_Detector1>\n" +
"                                <addressCA_Detector1>\n" +
"                                    <CI_AddressCA_Detector1>\n" +
"                                        <deliveryPointCA_Detector1>address line for the
location</deliveryPointCA_Detector1>\n" +
"                                        <cityCA_Detector1>city of the
location</cityCA_Detector1>\n" +
"                                        <administrativeAreaCA_Detector1>state, province of
the location</administrativeAreaCA_Detector1>\n" +
"                                        <postalCodeCA_Detector1>ZIP or other postal
code</postalCodeCA_Detector1>\n" +
"                                        <countryCA_Detector1>country of the physical
address</countryCA_Detector1>\n" +
"                                        <electronicMailAddressCA_Detector1>telephone number
of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector1>\n" +
"                                    </CI_AddressCA_Detector1>\n" +
"                                </addressCA_Detector1>\n" +
"                                <onlineResourceCA_Detector1>\n" +
"                                    <CI_OnlineResourceCA_Detector1>\n" +
"                                        <linkageCA_Detector1>location (address) for on-line
access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector1>\n" +
"                                        <protocolCA_Detector1>connection protocol to be
used</protocolCA_Detector1>\n" +
"                                        <applicationProfileCA_Detector1>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector1>\n" +
"                                        <nameCI_OnlineResourceCA_Detector1>name of the
online resource</nameCI_OnlineResourceCA_Detector1>\n" +
"                                        <descriptionCI_OnlineResourceCA_Detector1>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceCA_Detector1>\n" +
"
<functionCA_Detector1>download</functionCA_Detector1>\n" +
"                                    </CI_OnlineResourceCA_Detector1>\n" +
"                                </onlineResourceCA_Detector1>\n" +
"                                <hoursOfServiceCA_Detector1>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector1>\n" +
"                                <contactInstructionsCA_Detector1>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsCA_Detector1>\n" +
"                            </CI_ContactCA_Detector1>\n" +
"                        </contactInfoCA_Detector1>\n" +
"                        <roleCA_Detector1>resourceProvider</roleCA_Detector1>\n" +
"                    </CI_ResponsiblePartyCA_Detector1>\n" +
"                </pointOfContactCA_Detector>\n" +
"            </MD_IdentificationCA_Detector>\n" +
"        </detectorIdentification>\n" +
"        <sensitivity>response of an individual detector element relative to the
activation</sensitivity>\n" +
"        <pixelResponseNonUniformity>inhomogeneities of the response of the detectors of a
detector array to activation</pixelResponseNonUniformity>\n" +
"        <darkSignalNonUniformity>response of a detector element if no visible or infrared
light is present</darkSignalNonUniformity>\n" +
"
<errorTypeDarkSignalNonUniformity>standardDeviation</errorTypeDarkSignalNonUniformity>\n" +
"        <errorDarkSignalNonUniformity>0.0</errorDarkSignalNonUniformity>\n" +
"        <defectPixels>\n" +
"            <CA_DefectPixels>\n" +
```

```
"                <rowDefectPixels>0</rowDefectPixels>\n" +
"                <columnDefectPixels>0</columnDefectPixels>\n" +
"            </CA_DefectPixels>\n" +
"        </defectPixels>\n" +
"        <defectPixelsBrightImage>\n" +
"            <CA_DefectPixelsBrightImage>\n" +
"                <rowDefectPixelsBrightImage>0</rowDefectPixelsBrightImage>\n" +
"                <columnDefectPixelsBrightImage>0</columnDefectPixelsBrightImage>\n" +
"            </CA_DefectPixelsBrightImage>\n" +
"        </defectPixelsBrightImage>\n" +
"        <defectPixelsDarkImage>\n" +
"            <CA_DefectPixelsDarkImage>\n" +
"                <rowDefectPixelsDarkImage>0</rowDefectPixelsDarkImage>\n" +
"                <columnDefectPixelsDarkImage>0</columnDefectPixelsDarkImage>\n" +
"            </CA_DefectPixelsDarkImage>\n" +
"        </defectPixelsDarkImage>\n" +
"        <artefacts>description of other deficiencies of the detector</artefacts>\n" +
"        <maximumAllowedDefectPixels>0</maximumAllowedDefectPixels>\n" +
"
<maximumAllowedDefectPixelsDoubleColumn>0</maximumAllowedDefectPixelsDoubleColumn>\n" +
"
<maximumAllowedDefectPixelsSingleColumn>0</maximumAllowedDefectPixelsSingleColumn>\n" +
"    </CA_DetectorDemands>\n" +
"    <CA_DetectorOptics>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <case>1</case>\n" +
"        <numberOfPieces>0</numberOfPieces>\n" +
"        <gain>0.0</gain>\n" +
"        <offset>0.0</offset>\n" +
"        <signOfGain>1</signOfGain>\n" +
"        <minWavelength>0.0</minWavelength>\n" +
"        <maxWavelength>0.0</maxWavelength>\n" +
"        <b>0.0</b>\n" +
"        <c>0.0</c>\n" +
"        <sensorSystemIdentification>\n" +
"            <MD_IdentificationCA_RadiometryInSensor>\n" +
"                <citationCA_RadiometryInSensor>\n" +
"                    <CI_CitationCA_RadiometryInSensor>\n" +
"                        <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                        <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                        <dateCA_RadiometryInSensor>\n" +
"                            <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                            </CI_DateCA_RadiometryInSensor>\n" +
"                        </dateCA_RadiometryInSensor>\n" +
"                        <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                        <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                        </editionDateCA_RadiometryInSensor>\n" +
"                        <identifierCA_RadiometryInSensor>\n" +
"                            <MD_IdentifierCA_RadiometryInSensor>\n" +
"                                <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                                <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                            </MD_IdentifierCA_RadiometryInSensor>\n" +
"                        </identifierCA_RadiometryInSensor>\n" +
"                        <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                            <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                                <individualNameCA_RadiometryInSensor>name of the responsible
```

```
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                                <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                                <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                                <contactInfoCA_RadiometryInSensor>\n" +
"                                    <CI_ContactCA_RadiometryInSensor>\n" +
"                                        <phoneCA_RadiometryInSensor>\n" +
"                                            <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                                <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                                <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
```

```
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
```

```
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"        <detectorIdentification>\n" +
"            <MD_IdentificationCA_Detector>\n" +
"                <citationCA_Detector>\n" +
"                    <CI_CitationCA_Detector>\n" +
"                        <titleCA_Detector>name by which the cited resource is
known</titleCA_Detector>\n" +
"                        <alternateTitleCA_Detector>short name or other language name by
which the cited information is known</alternateTitleCA_Detector>\n" +
"                        <dateCA_Detector>\n" +
"                            <CI_DateCA_Detector>\n" +
"
<dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>\n" +
"                                <dateTypeCA_Detector>creation</dateTypeCA_Detector>\n" +
"                            </CI_DateCA_Detector>\n" +
"                        </dateCA_Detector>\n" +
"                        <editionCA_Detector>version of the cited
resource</editionCA_Detector>\n" +
"                        <editionDateCA_Detector>\n" +
"
<dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>\n" +
"                        </editionDateCA_Detector>\n" +
"                        <identifierCA_Detector>\n" +
"                            <MD_IdentifierCA_Detector>\n" +
"                                <authorityCA_Detector>person or party responsible for
maintenance of the namespace</authorityCA_Detector>\n" +
"                                <codeCA_Detector>alphanumeric value identifying an instance
in the namespace</codeCA_Detector>\n" +
"                            </MD_IdentifierCA_Detector>\n" +
"                        </identifierCA_Detector>\n" +
"                        <citedResponsiblePartyCA_Detector>\n" +
```

```
"                            <CI_ResponsiblePartyCA_Detector>\n" +
"                                <individualNameCA_Detector>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector>\n" +
"                                <organisationNameCA_Detector>name of the responsible
organization</organisationNameCA_Detector>\n" +
"                                <positionNameCA_Detector>role or position of the responsible
person</positionNameCA_Detector>\n" +
"                                <contactInfoCA_Detector>\n" +
"                                    <CI_ContactCA_Detector>\n" +
"                                        <phoneCA_Detector>\n" +
"                                            <CI_TelephoneCA_Detector>\n" +
"                                                <voiceCA_Detector>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector>\n" +
"                                                <facsimileCA_Detector>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector>\n" +
"                                            </CI_TelephoneCA_Detector>\n" +
"                                        </phoneCA_Detector>\n" +
"                                        <addressCA_Detector>\n" +
"                                            <CI_AddressCA_Detector>\n" +
"                                                <deliveryPointCA_Detector>address line for
the location</deliveryPointCA_Detector>\n" +
"                                                <cityCA_Detector>city of the
location</cityCA_Detector>\n" +
"                                                <administrativeAreaCA_Detector>state,
province of the location</administrativeAreaCA_Detector>\n" +
"                                                <postalCodeCA_Detector>ZIP or other postal
code</postalCodeCA_Detector>\n" +
"                                                <countryCA_Detector>country of the physical
address</countryCA_Detector>\n" +
"                                                <electronicMailAddressCA_Detector>telephone
number of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector>\n" +
"                                            </CI_AddressCA_Detector>\n" +
"                                        </addressCA_Detector>\n" +
"                                        <onlineResourceCA_Detector>\n" +
"                                            <CI_OnlineResourceCA_Detector>\n" +
"                                                <linkageCA_Detector>location (address) for
on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector>\n" +
"                                                <protocolCA_Detector>connection protocol to
be used</protocolCA_Detector>\n" +
"                                                <applicationProfileCA_Detector>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector>\n" +
"                                                <nameCI_OnlineResourceCA_Detector>name of
the online resource</nameCI_OnlineResourceCA_Detector>\n" +
"
<descriptionCI_OnlineResourceCA_Detector>detailed text description of what the online
resource is/does</descriptionCI_OnlineResourceCA_Detector>\n" +
"
<functionCA_Detector>download</functionCA_Detector>\n" +
"                                            </CI_OnlineResourceCA_Detector>\n" +
"                                        </onlineResourceCA_Detector>\n" +
"                                        <hoursOfServiceCA_Detector>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector>\n" +
"                                        <contactInstructionsCA_Detector>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_Detector>\n" +
"                                    </CI_ContactCA_Detector>\n" +
"                                </contactInfoCA_Detector>\n" +
"                                <roleCA_Detector>resourceProvider</roleCA_Detector>\n" +
"                            </CI_ResponsiblePartyCA_Detector>\n" +
"                        </citedResponsiblePartyCA_Detector>\n" +
"
<presentationFormCA_Detector>documentDigital</presentationFormCA_Detector>\n" +
"                        <seriesCA_Detector>\n" +
```

```
"                            <CI_SeriesCA_Detector>\n" +
"                                <nameCI_SeriesCA_Detector>name of the series, or aggregate
dataset, of which the dataset is a part</nameCI_SeriesCA_Detector>\n" +
"                                <issueIdentificationCA_Detector>information identifying the
issue of the series</issueIdentificationCA_Detector>\n" +
"                                <pageCA_Detector>details on which pages of the publication
the article was published</pageCA_Detector>\n" +
"                            </CI_SeriesCA_Detector>\n" +
"                        </seriesCA_Detector>\n" +
"                        <otherCitationDetailsCA_Detector>other information required to
complete the citation that is not recorded elsewhere</otherCitationDetailsCA_Detector>\n" +
"                        <collectiveTitleCA_Detector>common title with holdings
note</collectiveTitleCA_Detector>\n" +
"                        <ISBNCA_Detector>international Standard Book
Number</ISBNCA_Detector>\n" +
"                        <ISSNCA_Detector>international Standard Serial
Number</ISSNCA_Detector>\n" +
"                    </CI_CitationCA_Detector>\n" +
"                </citationCA_Detector>\n" +
"                <abstractCA_Detector>brief narrative summary of the content of the
resource(s)</abstractCA_Detector>\n" +
"                <purposeCA_Detector>summary of the intentions with which the resource(s) was
developed</purposeCA_Detector>\n" +
"                <creditCA_Detector>recognition of those who contributed to the
resource(s)</creditCA_Detector>\n" +
"                <statusCA_Detector>completed</statusCA_Detector>\n" +
"                <pointOfContactCA_Detector>\n" +
"                    <CI_ResponsiblePartyCA_Detector1>\n" +
"                        <individualNameCA_Detector1>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector1>\n" +
"                        <organisationNameCA_Detector1>name of the responsible
organization</organisationNameCA_Detector1>\n" +
"                        <positionNameCA_Detector1>role or position of the responsible
person</positionNameCA_Detector1>\n" +
"                        <contactInfoCA_Detector1>\n" +
"                            <CI_ContactCA_Detector1>\n" +
"                                <phoneCA_Detector1>\n" +
"                                    <CI_TelephoneCA_Detector1>\n" +
"                                        <voiceCA_Detector1>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector1>\n" +
"                                        <facsimileCA_Detector1>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector1>\n" +
"                                    </CI_TelephoneCA_Detector1>\n" +
"                                </phoneCA_Detector1>\n" +
"                                <addressCA_Detector1>\n" +
"                                    <CI_AddressCA_Detector1>\n" +
"                                        <deliveryPointCA_Detector1>address line for the
location</deliveryPointCA_Detector1>\n" +
"                                        <cityCA_Detector1>city of the
location</cityCA_Detector1>\n" +
"                                        <administrativeAreaCA_Detector1>state, province of
the location</administrativeAreaCA_Detector1>\n" +
"                                        <postalCodeCA_Detector1>ZIP or other postal
code</postalCodeCA_Detector1>\n" +
"                                        <countryCA_Detector1>country of the physical
address</countryCA_Detector1>\n" +
"                                        <electronicMailAddressCA_Detector1>telephone number
of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector1>\n" +
"                                    </CI_AddressCA_Detector1>\n" +
"                                </addressCA_Detector1>\n" +
"                                <onlineResourceCA_Detector1>\n" +
"                                    <CI_OnlineResourceCA_Detector1>\n" +
"                                        <linkageCA_Detector1>location (address) for on-line
access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector1>\n" +
"                                        <protocolCA_Detector1>connection protocol to be
```

```
used</protocolCA_Detector1>\n" +
"                                        <applicationProfileCA_Detector1>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector1>\n" +
"                                        <nameCI_OnlineResourceCA_Detector1>name of the
online resource</nameCI_OnlineResourceCA_Detector1>\n" +
"                                        <descriptionCI_OnlineResourceCA_Detector1>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceCA_Detector1>\n" +
"
<functionCA_Detector1>download</functionCA_Detector1>\n" +
"                                    </CI_OnlineResourceCA_Detector1>\n" +
"                                </onlineResourceCA_Detector1>\n" +
"                                <hoursOfServiceCA_Detector1>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector1>\n" +
"                                <contactInstructionsCA_Detector1>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsCA_Detector1>\n" +
"                            </CI_ContactCA_Detector1>\n" +
"                        </contactInfoCA_Detector1>\n" +
"                        <roleCA_Detector1>resourceProvider</roleCA_Detector1>\n" +
"                    </CI_ResponsiblePartyCA_Detector1>\n" +
"                </pointOfContactCA_Detector>\n" +
"            </MD_IdentificationCA_Detector>\n" +
"        </detectorIdentification>\n" +
"        <lightFalloff>decrease of activation of detector elements toward the border/end of
the detector array due to the imperfection of the lens</lightFalloff>\n" +
"    </CA_DetectorOptics>\n" +
"    <CA_Distortion>\n" +
"        <princPointOfSymmetry>0.0</princPointOfSymmetry>\n" +
"        <qualityOfPrincPointOfSymmetry>\n" +
"            <DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
element</standaloneQualityReportDetailsSD_Distortion>\n" +
"            </DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"        </qualityOfPrincPointOfSymmetry>\n" +
"        <selfCalibrationModel>brown</selfCalibrationModel>\n" +
"        <radialDistortion>\n" +
"            <CA_RadialDistortion>\n" +
"                <numberCoefficients>0</numberCoefficients>\n" +
"                <k>0.0</k>\n" +
"            </CA_RadialDistortion>\n" +
"        </radialDistortion>\n" +
"        <decenteringDistortion>\n" +
"            <CA_DecenteringDistortion>\n" +
"                <p1>0.0</p1>\n" +
"                <p2>0.0</p2>\n" +
"            </CA_DecenteringDistortion>\n" +
"        </decenteringDistortion>\n" +
"        <affineDistortion>\n" +
"            <CA_AffineDistortion>\n" +
"                <a1>0.0</a1>\n" +
"                <a2>0.0</a2>\n" +
"            </CA_AffineDistortion>\n" +
"        </affineDistortion>\n" +
"        <tangentialDistortion>\n" +
"            <CA_TangentialDistortion>\n" +
"                <t1>0.0</t1>\n" +
"                <t2>0.0</t2>\n" +
"            </CA_TangentialDistortion>\n" +
"        </tangentialDistortion>\n" +
"        <affineFraserDistortion>\n" +
"            <CA_AffineFraserDistortion>\n" +
"                <f1>0.0</f1>\n" +
"                <f2>0.0</f2>\n" +
"            </CA_AffineFraserDistortion>\n" +
```

```
"        </affineFraserDistortion>\n" +
"        <smacParameters>\n" +
"            <CA_SMACParameters>\n" +
"                <k>0.0</k>\n" +
"                <p1>0.0</p1>\n" +
"                <p2>0.0</p2>\n" +
"            </CA_SMACParameters>\n" +
"        </smacParameters>\n" +
"        <ebnerParameters>\n" +
"            <CA_EbnerParameters>\n" +
"                <e1>0.0</e1>\n" +
"                <e2>0.0</e2>\n" +
"                <e3>0.0</e3>\n" +
"                <e4>0.0</e4>\n" +
"                <e5>0.0</e5>\n" +
"                <e6>0.0</e6>\n" +
"                <e7>0.0</e7>\n" +
"                <e8>0.0</e8>\n" +
"                <e9>0.0</e9>\n" +
"                <e10>0.0</e10>\n" +
"                <e11>0.0</e11>\n" +
"                <e12>0.0</e12>\n" +
"            </CA_EbnerParameters>\n" +
"        </ebnerParameters>\n" +
"        <jacobsenParameters>\n" +
"            <CA_JacobsenParameters>\n" +
"                <j1>0.0</j1>\n" +
"                <j2>0.0</j2>\n" +
"                <j3>0.0</j3>\n" +
"                <j4>0.0</j4>\n" +
"                <j5>0.0</j5>\n" +
"                <j6>0.0</j6>\n" +
"                <j7>0.0</j7>\n" +
"                <j8>0.0</j8>\n" +
"                <j9>0.0</j9>\n" +
"                <j10>0.0</j10>\n" +
"                <j11>0.0</j11>\n" +
"                <j12>0.0</j12>\n" +
"                <j13>0.0</j13>\n" +
"                <j14>0.0</j14>\n" +
"                <j15>0.0</j15>\n" +
"            </CA_JacobsenParameters>\n" +
"        </jacobsenParameters>\n" +
"        <software>name of the software product applied for the calibration
processing</software>\n" +
"        <propertiesAlgorithm>name and the properties of the algorithm that is programmed in
the software</propertiesAlgorithm>\n" +
"        <sigmaNaught uom=\"#m\">0.0</sigmaNaught>\n" +
"    </CA_Distortion>\n" +
"    <CA_DistortionPolynomial>\n" +
"        <princPointOfSymmetry>0.0</princPointOfSymmetry>\n" +
"        <qualityOfPrincPointOfSymmetry>\n" +
"            <DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
element</standaloneQualityReportDetailsSD_Distortion>\n" +
"            </DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"        </qualityOfPrincPointOfSymmetry>\n" +
"        <polynomialDecentering>\n" +
"            <SD_PolynomialFunction1>\n" +
"                <resultDimension1>column</resultDimension1>\n" +
"            </SD_PolynomialFunction1>\n" +
"        </polynomialDecentering>\n" +
"        <polynomialRadial>\n" +
"            <SD_PolynomialFunction2>\n" +
"                <resultDimension2>column</resultDimension2>\n" +
"            </SD_PolynomialFunction2>\n" +
"        </polynomialRadial>\n" +
```

```
"       <qualityOfPolynomialRadial>\n" +
"           <DQ_PositionalAccuracySD_DistortionPolynomial>\n" +
"               <standaloneQualityReportDetailsSD_DistortionPolynomial>description of the
data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial>\n" +
"           </DQ_PositionalAccuracySD_DistortionPolynomial>\n" +
"       </qualityOfPolynomialRadial>\n" +
"       <qualityOfPolynomialDecentering>\n" +
"           <DQ_PositionalAccuracySD_DistortionPolynomial1>\n" +
"               <standaloneQualityReportDetailsSD_DistortionPolynomial1>description of the
data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial1>\n" +
"           </DQ_PositionalAccuracySD_DistortionPolynomial1>        \n" +
"       </qualityOfPolynomialDecentering>\n" +
"       <polynomialDegree>0</polynomialDegree>\n" +
"       <polynomialCoefficients>0.0</polynomialCoefficients>\n" +
"       <thinSplineDegree>0</thinSplineDegree>\n" +
"       <thinSplineCoefficients>0.0</thinSplineCoefficients>\n" +
"   </CA_DistortionPolynomial>\n" +
"   <CA_Documentation>\n" +
"       <certificateIdentification>\n" +
"           <MD_IdentifierCA_Documentation>\n" +
"               <authorityCA_Documentation>person or party responsible for maintenance of
the namespace</authorityCA_Documentation>\n" +
"               <codeCA_Documentation>alphanumeric value identifying an instance in the
namespace</codeCA_Documentation>\n" +
"           </MD_IdentifierCA_Documentation>\n" +
"       </certificateIdentification>\n" +
"       <dataProductLevel>rawData</dataProductLevel> \n" +
"       <geometricQuality>\n" +
"           <CA_PositionalErrorCA_Documentation>\n" +
"               <errorXCA_Documentation uom=\"#m\">0.0</errorXCA_Documentation>\n" +
"               <errorYCA_Documentation uom=\"#m\">0.0</errorYCA_Documentation>\n" +
"               <errorZCA_Documentation uom=\"#m\">0.0</errorZCA_Documentation>\n" +
"               <errorXYCA_Documentation uom=\"#m\">0.0</errorXYCA_Documentation>\n" +
"               <errorXYZCA_Documentation uom=\"#m\">0.0</errorXYZCA_Documentation>\n" +
"               <pointTypeCA_Documentation>controlPoint</pointTypeCA_Documentation>\n" +
"               <errorTypeCA_Documentation>standardDeviation</errorTypeCA_Documentation>\n" +
"               <quantityTypeCA_Documentation>minimum</quantityTypeCA_Documentation>\n" +
"           </CA_PositionalErrorCA_Documentation>\n" +
"       </geometricQuality> \n" +
"       <geometricRadialResolution>\n" +
"
<geometricResolutionCA_Documentation>0.0</geometricResolutionCA_Documentation>\n" +
"       </geometricRadialResolution>\n" +
"       <geometricTangentialResolution>\n" +
"
<geometricResolutionCA_Documentation1>0.0</geometricResolutionCA_Documentation1>\n" +
"       </geometricTangentialResolution>\n" +
"       <radiometricQuality>\n" +
"           <DQ_QuantitativeAttributeAccuracyCA_Documentation>\n" +
"               <standaloneQualityReportDetailsCA_Documentation>description of the data
quality element</standaloneQualityReportDetailsCA_Documentation>\n" +
"           </DQ_QuantitativeAttributeAccuracyCA_Documentation>\n" +
"       </radiometricQuality>\n" +
"       <stabilizedPlatform>information about the applied stabilized
platform</stabilizedPlatform>  \n" +
"   </CA_Documentation>\n" +
"   <CA_DynamicRange>\n" +
"       <minimumGreyValue>0.0</minimumGreyValue>\n" +
"       <maximumGreyValue>0.0</maximumGreyValue>\n" +
"   </CA_DynamicRange>\n" +
"   <CA_EbnerParameters>\n" +
"       <e1>0.0</e1>\n" +
"       <e2>0.0</e2>\n" +
"       <e3>0.0</e3>\n" +
"       <e4>0.0</e4>\n" +
"       <e5>0.0</e5>\n" +
"       <e6>0.0</e6>\n" +
```

```
"       <e7>0.0</e7>\n" +
"       <e8>0.0</e8>\n" +
"       <e9>0.0</e9>\n" +
"       <e10>0.0</e10>\n" +
"       <e11>0.0</e11>\n" +
"       <e12>0.0</e12>\n" +
"   </CA_EbnerParameters>\n" +
"   <CA_ElectronicCell>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
```

```
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
```

```
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
```

```
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"       </sensorSystemIdentification>\n" +
"       <numberSensorHeads>1</numberSensorHeads>\n" +
"       <detectorIdentification>\n" +
"           <MD_IdentificationCA_Detector>\n" +
"               <citationCA_Detector>\n" +
"                   <CI_CitationCA_Detector>\n" +
"                       <titleCA_Detector>name by which the cited resource is
known</titleCA_Detector>\n" +
"                       <alternateTitleCA_Detector>short name or other language name by
which the cited information is known</alternateTitleCA_Detector>\n" +
"                       <dateCA_Detector>\n" +
"                           <CI_DateCA_Detector>\n" +
"
<dateCI_DateCA_Detector>1-09-2015</dateCI_DateCA_Detector>\n" +
"                               <dateTypeCA_Detector>creation</dateTypeCA_Detector>\n" +
"                           </CI_DateCA_Detector>\n" +
"                       </dateCA_Detector>\n" +
"                       <editionCA_Detector>version of the cited
resource</editionCA_Detector>\n" +
"                       <editionDateCA_Detector>\n" +
"
<dateEditionDateCA_Detector>1-09-2015</dateEditionDateCA_Detector>\n" +
"                       </editionDateCA_Detector>\n" +
"                       <identifierCA_Detector>\n" +
"                           <MD_IdentifierCA_Detector>\n" +
"                               <authorityCA_Detector>person or party responsible for
maintenance of the namespace</authorityCA_Detector>\n" +
"                               <codeCA_Detector>alphanumeric value identifying an instance
in the namespace</codeCA_Detector>\n" +
"                           </MD_IdentifierCA_Detector>\n" +
"                       </identifierCA_Detector>\n" +
"                       <citedResponsiblePartyCA_Detector>\n" +
"                           <CI_ResponsiblePartyCA_Detector>\n" +
"                               <individualNameCA_Detector>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector>\n" +
"                               <organisationNameCA_Detector>name of the responsible
organization</organisationNameCA_Detector>\n" +
"                               <positionNameCA_Detector>role or position of the responsible
person</positionNameCA_Detector>\n" +
"                               <contactInfoCA_Detector>\n" +
"                                   <CI_ContactCA_Detector>\n" +
"                                       <phoneCA_Detector>\n" +
"                                           <CI_TelephoneCA_Detector>\n" +
"                                               <voiceCA_Detector>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector>\n" +
"                                               <facsimileCA_Detector>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector>\n" +
"                                           </CI_TelephoneCA_Detector>\n" +
```

```
"                                        </phoneCA_Detector>\n" +
"                                        <addressCA_Detector>\n" +
"                                            <CI_AddressCA_Detector>\n" +
"                                                <deliveryPointCA_Detector>address line for
the location</deliveryPointCA_Detector>\n" +
"                                                <cityCA_Detector>city of the
location</cityCA_Detector>\n" +
"                                                <administrativeAreaCA_Detector>state,
province of the location</administrativeAreaCA_Detector>\n" +
"                                                <postalCodeCA_Detector>ZIP or other postal
code</postalCodeCA_Detector>\n" +
"                                                <countryCA_Detector>country of the physical
address</countryCA_Detector>\n" +
"                                                <electronicMailAddressCA_Detector>telephone
number of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector>\n" +
"                                            </CI_AddressCA_Detector>\n" +
"                                        </addressCA_Detector>\n" +
"                                        <onlineResourceCA_Detector>\n" +
"                                            <CI_OnlineResourceCA_Detector>\n" +
"                                                <linkageCA_Detector>location (address) for
on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector>\n" +
"                                                <protocolCA_Detector>connection protocol to
be used</protocolCA_Detector>\n" +
"                                                <applicationProfileCA_Detector>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector>\n" +
"                                                <nameCI_OnlineResourceCA_Detector>name of
the online resource</nameCI_OnlineResourceCA_Detector>\n" +
"
<descriptionCI_OnlineResourceCA_Detector>detailed text description of what the online
resource is/does</descriptionCI_OnlineResourceCA_Detector>\n" +
"
<functionCA_Detector>download</functionCA_Detector>\n" +
"                                            </CI_OnlineResourceCA_Detector>\n" +
"                                        </onlineResourceCA_Detector>\n" +
"                                        <hoursOfServiceCA_Detector>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector>\n" +
"                                        <contactInstructionsCA_Detector>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_Detector>\n" +
"                                    </CI_ContactCA_Detector>\n" +
"                                </contactInfoCA_Detector>\n" +
"                                <roleCA_Detector>resourceProvider</roleCA_Detector>\n" +
"                            </CI_ResponsiblePartyCA_Detector>\n" +
"                        </citedResponsiblePartyCA_Detector>\n" +
"
<presentationFormCA_Detector>documentDigital</presentationFormCA_Detector>\n" +
"                        <seriesCA_Detector>\n" +
"                            <CI_SeriesCA_Detector>\n" +
"                                <nameCI_SeriesCA_Detector>name of the series, or aggregate
dataset, of which the dataset is a part</nameCI_SeriesCA_Detector>\n" +
"                                <issueIdentificationCA_Detector>information identifying the
issue of the series</issueIdentificationCA_Detector>\n" +
"                                <pageCA_Detector>details on which pages of the publication
the article was published</pageCA_Detector>\n" +
"                            </CI_SeriesCA_Detector>\n" +
"                        </seriesCA_Detector>\n" +
"                        <otherCitationDetailsCA_Detector>other information required to
complete the citation that is not recorded elsewhere</otherCitationDetailsCA_Detector>\n" +
"                        <collectiveTitleCA_Detector>common title with holdings
note</collectiveTitleCA_Detector>\n" +
"                        <ISBNCA_Detector>international Standard Book
Number</ISBNCA_Detector>\n" +
"                        <ISSNCA_Detector>international Standard Serial
```

```
Number</ISSNCA_Detector>\n" +
"                    </CI_CitationCA_Detector>\n" +
"                </citationCA_Detector>\n" +
"                <abstractCA_Detector>brief narrative summary of the content of the
resource(s)</abstractCA_Detector>\n" +
"                <purposeCA_Detector>summary of the intentions with which the resource(s) was
developed</purposeCA_Detector>\n" +
"                <creditCA_Detector>recognition of those who contributed to the
resource(s)</creditCA_Detector>\n" +
"                <statusCA_Detector>completed</statusCA_Detector>\n" +
"                <pointOfContactCA_Detector>\n" +
"                    <CI_ResponsiblePartyCA_Detector1>\n" +
"                        <individualNameCA_Detector1>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Detector1>\n" +
"                        <organisationNameCA_Detector1>name of the responsible
organization</organisationNameCA_Detector1>\n" +
"                        <positionNameCA_Detector1>role or position of the responsible
person</positionNameCA_Detector1>\n" +
"                        <contactInfoCA_Detector1>\n" +
"                            <CI_ContactCA_Detector1>\n" +
"                                <phoneCA_Detector1>\n" +
"                                    <CI_TelephoneCA_Detector1>\n" +
"                                        <voiceCA_Detector1>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Detector1>\n" +
"                                        <facsimileCA_Detector1>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Detector1>\n" +
"                                    </CI_TelephoneCA_Detector1>\n" +
"                                </phoneCA_Detector1>\n" +
"                                <addressCA_Detector1>\n" +
"                                    <CI_AddressCA_Detector1>\n" +
"                                        <deliveryPointCA_Detector1>address line for the
location</deliveryPointCA_Detector1>\n" +
"                                        <cityCA_Detector1>city of the
location</cityCA_Detector1>\n" +
"                                        <administrativeAreaCA_Detector1>state, province of
the location</administrativeAreaCA_Detector1>\n" +
"                                        <postalCodeCA_Detector1>ZIP or other postal
code</postalCodeCA_Detector1>\n" +
"                                        <countryCA_Detector1>country of the physical
address</countryCA_Detector1>\n" +
"                                        <electronicMailAddressCA_Detector1>telephone number
of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Detector1>\n" +
"                                    </CI_AddressCA_Detector1>\n" +
"                                </addressCA_Detector1>\n" +
"                                <onlineResourceCA_Detector1>\n" +
"                                    <CI_OnlineResourceCA_Detector1>\n" +
"                                        <linkageCA_Detector1>location (address) for on-line
access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Detector1>\n" +
"                                        <protocolCA_Detector1>connection protocol to be
used</protocolCA_Detector1>\n" +
"                                        <applicationProfileCA_Detector1>name of an
application profile that can be used with the online
resource</applicationProfileCA_Detector1>\n" +
"                                        <nameCI_OnlineResourceCA_Detector1>name of the
online resource</nameCI_OnlineResourceCA_Detector1>\n" +
"                                        <descriptionCI_OnlineResourceCA_Detector1>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceCA_Detector1>\n" +
"
<functionCA_Detector1>download</functionCA_Detector1>\n" +
"                                    </CI_OnlineResourceCA_Detector1>\n" +
"                                </onlineResourceCA_Detector1>\n" +
"                                <hoursOfServiceCA_Detector1>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Detector1>\n" +
```

```
"                                <contactInstructionsCA_Detector1>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsCA_Detector1>\n" +
"                            </CI_ContactCA_Detector1>\n" +
"                        </contactInfoCA_Detector1>\n" +
"                        <roleCA_Detector1>resourceProvider</roleCA_Detector1>\n" +
"                    </CI_ResponsiblePartyCA_Detector1>\n" +
"                </pointOfContactCA_Detector>\n" +
"            </MD_IdentificationCA_Detector>\n" +
"        </detectorIdentification>\n" +
"        <sensitivity>response of an individual detector element relative to the
activation</sensitivity>\n" +
"        <pixelResponseNonUniformity>inhomogenities of the response of the detectors of a
detector array to activation</pixelResponseNonUniformity>\n" +
"        <darkSignalNonUniformity>response of a detector element if no visible or infrared
light is present</darkSignalNonUniformity>\n" +
"
<errorTypeDarkSignalNonUniformity>standardDeviation</errorTypeDarkSignalNonUniformity>\n" +
"        <errorDarkSignalNonUniformity>0.0</errorDarkSignalNonUniformity>\n" +
"        <defectPixels>\n" +
"            <CA_DefectPixels>\n" +
"                <row>0</row>\n" +
"                <column>0</column>\n" +
"            </CA_DefectPixels>\n" +
"        </defectPixels>\n" +
"        <defectPixelsBrightImage>\n" +
"            <CA_DefectPixelsBrightImage>\n" +
"                <rowDefectPixelsBrightImage>0</rowDefectPixelsBrightImage>\n" +
"                <columnDefectPixelsBrightImage>0</columnDefectPixelsBrightImage>\n" +
"            </CA_DefectPixelsBrightImage>\n" +
"        </defectPixelsBrightImage>\n" +
"        <defectPixelsDarkImage>\n" +
"            <CA_DefectPixelsDarkImage>\n" +
"                <rowDefectPixelsDarkImage>0</rowDefectPixelsDarkImage>\n" +
"                <columnDefectPixelsDarkImage>0</columnDefectPixelsDarkImage>\n" +
"            </CA_DefectPixelsDarkImage>\n" +
"        </defectPixelsDarkImage>\n" +
"        <artefacts>description of other deficiencies of the detector</artefacts>\n" +
"    </CA_ElectronicCell>\n" +
"    <CA_GeometricPreCorrection>\n" +
"        <polynomialDegree>0</polynomialDegree>\n" +
"        <polynomialCoefficients>0.0</polynomialCoefficients>\n" +
"        <resamplingDateCA_GeometricPreCorrection>1-09-2015
12:00:00</resamplingDateCA_GeometricPreCorrection>\n" +
"        <parametersCA_GeometricPreCorrection>0.0</parametersCA_GeometricPreCorrection>\n" +
"    </CA_GeometricPreCorrection>\n" +
"    <CA_GeometricResolution>\n" +
"        <geometricResolution>0.0</geometricResolution>\n" +
"    </CA_GeometricResolution>\n" +
"    <CA_GeometricTarget>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <sizeCA_GeometricTarget uom=\"#m\">0.0</sizeCA_GeometricTarget>\n" +
"        <descriptionCA_GeometricTarget>free text description of the
target</descriptionCA_GeometricTarget>\n" +
"        <typeCA_GeometricTarget>airforcePattern</typeCA_GeometricTarget>\n" +
"        <material>awning</material>\n" +
"        <paintType>characteristics of the paint</paintType>\n" +
"        <reflectanceProperties>peculiarity of the reflectance</reflectanceProperties>\n" +
"    </CA_GeometricTarget>\n" +
"    <CA_GeometryValidation>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <validationMethod>testfield</validationMethod>\n" +
"        <validationTimeCA_GeometryValidation>0-0-0
00:00:00</validationTimeCA_GeometryValidation>\n" +
"    </CA_GeometryValidation>\n" +
"    <CA_GNSS>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
```

```
"        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>\n" +
"        <geometryCalibrationType>more detailed explanation of the the calibration
type</geometryCalibrationType>\n" +
"        <synchronizationCA_GNSS>0-0-0 00:00:00</synchronizationCA_GNSS>\n" +
"        <synchronizationErrorCA_GNSS>0-0-0 00:00:00</synchronizationErrorCA_GNSS>\n" +
"        <referenceTemperatureCA_GNSS>\n" +
"            <CA_TemperatureCA_GNSS>\n" +
"                <temperatureCA_GNSS>0.0</temperatureCA_GNSS>\n" +
"            </CA_TemperatureCA_GNSS>\n" +
"        </referenceTemperatureCA_GNSS>\n" +
"        <versionFirmwareCA_GNSS>note about the firmware version</versionFirmwareCA_GNSS>\n" +
"        <versionHardwareCA_GNSS>note about the hardware version</versionHardwareCA_GNSS>\n" +
"        <timeLeverarmCA_GNSS>0-0-0 00:00:00</timeLeverarmCA_GNSS>\n" +
"        <leverarmCA_GNSS>0.0</leverarmCA_GNSS>\n" +
"        <errorLeverarmCA_GNSS uom=\"#m\">0.0</errorLeverarmCA_GNSS>\n" +
"        <numberSatellites>4</numberSatellites>\n" +
"        <registrationCycle>0-0-0 00:00:00</registrationCycle>\n" +
"    </CA_GNSS>\n" +
"    <CA_IMU>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>\n" +
"        <geometryCalibrationType>more detailed explanation of the the calibration
type</geometryCalibrationType>\n" +
"        <synchronizationCA_IMU>0-0-0 00:00:00</synchronizationCA_IMU>\n" +
"        <synchronizationErrorCA_IMU>0-0-0 00:00:00</synchronizationErrorCA_IMU>\n" +
"        <referenceTemperatureCA_IMU>\n" +
"            <CA_TemperatureCA_IMU>\n" +
"                <temperatureCA_IMU>0.0</temperatureCA_IMU>\n" +
"            </CA_TemperatureCA_IMU>\n" +
"        </referenceTemperatureCA_IMU>\n" +
"        <versionFirmwareCA_IMU>note about the firmware version</versionFirmwareCA_IMU>\n" +
"        <versionHardwareCA_IMU>note about the hardware version</versionHardwareCA_IMU>\n" +
"        <timeLeverarmCA_IMU>0-0-0 00:00:00</timeLeverarmCA_IMU>\n" +
"        <leverarmCA_IMU>0.0</leverarmCA_IMU>\n" +
"        <errorLeverarmCA_IMU uom=\"#m\">0.0</errorLeverarmCA_IMU>\n" +
"        <boresightAngle>\n" +
"            <SD_AttitudeCA_IMU>\n" +
"                <angleAttitudeCA_IMU>\n" +
"                    <SD_AngleAttitudeCA_IMU>\n" +
"                        <rotatedAxesCA_IMU>yes</rotatedAxesCA_IMU>\n" +
"                        <rotationAngleXCA_IMU uom=\"#m\">0.0</rotationAngleXCA_IMU>\n" +
"                        <rotationAngleYCA_IMU uom=\"#m\">0.0</rotationAngleYCA_IMU>\n" +
"                        <rotationAngleZCA_IMU uom=\"#m\">0.0</rotationAngleZCA_IMU>\n" +
"                        <rotationSequenceCA_IMU>XYZ</rotationSequenceCA_IMU>\n" +
"                    </SD_AngleAttitudeCA_IMU>\n" +
"                </angleAttitudeCA_IMU>\n" +
"                <matrixAttitudeCA_IMU>\n" +
"                    <SD_MatrixAttitudeCA_IMU>\n" +
"                        <matrixElements1CA_IMU>0.0</matrixElements1CA_IMU>\n" +
"                        <matrixElements2CA_IMU>0.0</matrixElements2CA_IMU>\n" +
"                        <matrixElements3CA_IMU>0.0</matrixElements3CA_IMU>\n" +
"                        <matrixElements4CA_IMU>0.0</matrixElements4CA_IMU>\n" +
"                        <matrixElements5CA_IMU>0.0</matrixElements5CA_IMU>\n" +
"                        <matrixElements6CA_IMU>0.0</matrixElements6CA_IMU>\n" +
"                        <matrixElements7CA_IMU>0.0</matrixElements7CA_IMU>\n" +
"                        <matrixElements8CA_IMU>0.0</matrixElements8CA_IMU>\n" +
"                        <matrixElements9CA_IMU>0.0</matrixElements9CA_IMU>\n" +
"                    </SD_MatrixAttitudeCA_IMU>\n" +
"                </matrixAttitudeCA_IMU>\n" +
"            </SD_AttitudeCA_IMU>        \n" +
"        </boresightAngle>\n" +
"        <dataRate>0-0-0 00:00:00</dataRate>\n" +
"        <attitudeAccuracy uom=\"#m\">0.0</attitudeAccuracy>\n" +
"    </CA_IMU>\n" +
"    <CA_InFlight>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"    </CA_InFlight>\n" +
```

```
"   <CA_InteriorOrientation>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>\n" +
"       <geometryCalibrationType>more detailed explanation of the the calibration
type</geometryCalibrationType>\n" +
"       <synchronizationCA_InteriorOrientation>0-0-0
00:00:00</synchronizationCA_InteriorOrientation>\n" +
"       <synchronizationErrorCA_InteriorOrientation>0-0-0
00:00:00</synchronizationErrorCA_InteriorOrientation>\n" +
"       <referenceTemperatureCA_InteriorOrientation>\n" +
"           <CA_TemperatureCA_InteriorOrientation>\n" +
"
<temperatureCA_InteriorOrientation>0.0</temperatureCA_InteriorOrientation>\n" +
"           </CA_TemperatureCA_InteriorOrientation>\n" +
"       </referenceTemperatureCA_InteriorOrientation>\n" +
"       <versionFirmwareCA_InteriorOrientation>note about the firmware
version</versionFirmwareCA_InteriorOrientation>\n" +
"       <versionHardwareCA_InteriorOrientation>note about the hardware
version</versionHardwareCA_InteriorOrientation>\n" +
"   </CA_InteriorOrientation>\n" +
"   <CA_JacobsenParameters>\n" +
"       <j1>0.0</j1>\n" +
"       <j2>0.0</j2>\n" +
"       <j3>0.0</j3>\n" +
"       <j4>0.0</j4>\n" +
"       <j5>0.0</j5>\n" +
"       <j6>0.0</j6>\n" +
"       <j7>0.0</j7>\n" +
"       <j8>0.0</j8>\n" +
"       <j9>0.0</j9>\n" +
"       <j10>0.0</j10>\n" +
"       <j11>0.0</j11>\n" +
"       <j12>0.0</j12>\n" +
"       <j13>0.0</j13>\n" +
"       <j14>0.0</j14>\n" +
"       <j15>0.0</j15>\n" +
"   </CA_JacobsenParameters>\n" +
"   <CA_Laboratory>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <calibrationInstrument>calibrationCage</calibrationInstrument>\n" +
"       <pointSuspension>cage</pointSuspension>\n" +
"   </CA_Laboratory>\n" +
"   <CA_Linearity>\n" +
"       <channelIdentification>alpha-numerical identification for the
channel</channelIdentification>\n" +
"       <receivedIntensity>0.0</receivedIntensity>\n" +
"       <recordedIntensity>0.0</recordedIntensity>\n" +
"   </CA_Linearity>\n" +
"   <CA_LUT>\n" +
"       <identification>Characterization of the LUT</identification>\n" +
"       <in>0</in>\n" +
"       <out>0</out>\n" +
"   </CA_LUT>\n" +
"   <CA_MeasuredReflectance>\n" +
"       <intensity>0.0</intensity>\n" +
"       <wavelengthCA_MeasuredReflectance
uom=\"#m\">0.0</wavelengthCA_MeasuredReflectance>\n" +
"       <zenithAngle uom=\"#m\">0.0</zenithAngle>\n" +
"       <azimuth uom=\"#m\">0.0</azimuth>\n" +
"   </CA_MeasuredReflectance>\n" +
"   <CA_ObjectToObject>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>\n" +
"       <lampType>type of illumination used</lampType>\n" +
"       <atmosphericConditionCA_RadiometryInFlight>state of the
atmosphere</atmosphericConditionCA_RadiometryInFlight>\n" +
"       <aerosolQuantity>0.0</aerosolQuantity>\n" +
```

```
"       <numberImages>0</numberImages>\n" +
"       <rmse>0.0</rmse>\n" +
"   </CA_ObjectToObject>\n" +
"   <CA_OpticalFilters>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>      \n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                           </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                       </phoneCA_RadiometryInSensor>\n" +
"                                       <addressCA_RadiometryInSensor>\n" +
"                                           <CI_AddressCA_RadiometryInSensor>\n" +
```

```
"                                                    <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                    <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                    <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                    <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                                </CI_AddressCA_RadiometryInSensor>\n" +
"                                            </addressCA_RadiometryInSensor>\n" +
"                                            <onlineResourceCA_RadiometryInSensor>\n" +
"                                                <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                    <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                    <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                                </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                            </onlineResourceCA_RadiometryInSensor>\n" +
"                                            <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                        </CI_ContactCA_RadiometryInSensor>\n" +
"                                    </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                                </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                            </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                            <seriesCA_RadiometryInSensor>\n" +
"                                <CI_SeriesCA_RadiometryInSensor>\n" +
"                                    <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                    <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                    <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                                </CI_SeriesCA_RadiometryInSensor>\n" +
"                            </seriesCA_RadiometryInSensor>\n" +
"                            <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                            <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                            <ISBNCA_RadiometryInSensor>international Standard Book
```

```
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
```

```
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <spectralCharacteristicsCA_OpticalFilters>\n" +
"            <CA_SpectrumCA_OpticalFilters>\n" +
"                <numberBandsCA_OpticalFilters>0</numberBandsCA_OpticalFilters>\n" +
"                <wavelengthCA_SpectrumCA_OpticalFilters
uom=\"#m\">0.0</wavelengthCA_SpectrumCA_OpticalFilters>\n" +
"                <responseCA_OpticalFilters>0.0</responseCA_OpticalFilters>\n" +
"            </CA_SpectrumCA_OpticalFilters>\n" +
"        </spectralCharacteristicsCA_OpticalFilters>\n" +
"    </CA_OpticalFilters>\n" +
"    <CA_OpticalSensors>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"    </CA_OpticalSensors>\n" +
"    <CA_OpticalSystem>\n" +
"        <calibratedFocalLength uom=\"#m\">0.0</calibratedFocalLength>\n" +
"        <qualityOfCalibratedFocalLength>\n" +
"            <DQ_QuantitativeAttributeAccuracySD_OpticalSystem>\n" +
"                <standaloneQualityReportDetailsSD_OpticalSystem>description of the data
quality element</standaloneQualityReportDetailsSD_OpticalSystem>\n" +
"            </DQ_QuantitativeAttributeAccuracySD_OpticalSystem>\n" +
"        </qualityOfCalibratedFocalLength>\n" +
"        <princPointAutocoll>0.0</princPointAutocoll>\n" +
"        <covPrincPtAutocoll>\n" +
"            <DQ_PositionalAccuracySD_OpticalSystem1>\n" +
"                <standaloneQualityReportDetailsSD_OpticalSystem1>description of the data
quality element</standaloneQualityReportDetailsSD_OpticalSystem1>\n" +
"            </DQ_PositionalAccuracySD_OpticalSystem1>       \n" +
"        </covPrincPtAutocoll>\n" +
"        <resolvingPower>\n" +
"            <CA_GeometricResolutionCA_OpticalSystem>\n" +
"
<geometricResolutionCA_OpticalSystem>0.0</geometricResolutionCA_OpticalSystem>\n" +
"            </CA_GeometricResolutionCA_OpticalSystem>\n" +
"        </resolvingPower>\n" +
"        <virtualFocalLength uom=\"#m\">0.0</virtualFocalLength>\n" +
"        <virtualSensorSize uom=\"#m\">0.0</virtualSensorSize>\n" +
"        <virtualPixelSize uom=\"#m\">0.0</virtualPixelSize>\n" +
"        <virtualPrinciplePointAutocoll>0.0</virtualPrinciplePointAutocoll>\n" +
"    </CA_OpticalSystem>\n" +
"    <CA_Optics>\n" +
"        <cameraHead>description of the respective camera head</cameraHead>\n" +
"        <channel>description of the available spectral channels</channel>\n" +
"    </CA_Optics>\n" +
"    <CA_OpticsFacilityGeometry>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"    </CA_OpticsFacilityGeometry>\n" +
"    <CA_OpticsFacilityRadiometry>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>\n" +
"    </CA_OpticsFacilityRadiometry>\n" +
"    <CA_OpticsSensorGeometry>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
```

```
"       <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>\n" +
"       <geometryCalibrationType>more detailed explanation of the calibration
type</geometryCalibrationType>\n" +
"   </CA_OpticsSensorGeometry>\n" +
"   <CA_OpticsSensorRadiometry>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"   </CA_OpticsSensorRadiometry>\n" +
"   <CA_OpticsValidation>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"   </CA_OpticsValidation>\n" +
"   <CA_OptoElectronicSystem>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
```

```
"                                <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                                <contactInfoCA_RadiometryInSensor>\n" +
"                                    <CI_ContactCA_RadiometryInSensor>\n" +
"                                        <phoneCA_RadiometryInSensor>\n" +
"                                            <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                                <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                                <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
```

```
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
```

```
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"    </CA_OptoElectronicSystem>\n" +
"    <CA_PhotoFlight>\n" +
"        <numberOfPhotoFlights>0</numberOfPhotoFlights>\n" +
"        <photoScale>0.0</photoScale>\n" +
"        <flyingHeight uom=\"#m\">0.0</flyingHeight>\n" +
"        <flyingAltitudeAboveGround uom=\"#m\">0.0</flyingAltitudeAboveGround>\n" +
"        <terrainHeight uom=\"\">0.0</terrainHeight>\n" +
"        <alongStripOverlap>0.0</alongStripOverlap>\n" +
"        <acrossStripOverlap>0.0</acrossStripOverlap>\n" +
"        <base uom=\"#m\">0.0</base>\n" +
"        <numberOfPhotos>0</numberOfPhotos>\n" +
"        <numberOfStrips>0</numberOfStrips>\n" +
"        <numberOfPhotosAlongStrip>0</numberOfPhotosAlongStrip>\n" +
"        <numberOfPhotosUsed>0</numberOfPhotosUsed>\n" +
"    </CA_PhotoFlight>\n" +
"    <CA_PointSpreadFunction>\n" +
"        <shapeCA_PointSpreadFunction>square</shapeCA_PointSpreadFunction>\n" +
"        <spreading>characteristic parameters or as a discrete function</spreading>\n" +
"    </CA_PointSpreadFunction>\n" +
"    <CA_PositionalError>\n" +
"        <errorXCA_PositionalError uom=\"#m\">0.0</errorXCA_PositionalError>\n" +
"        <errorYCA_PositionalError uom=\"#m\">0.0</errorYCA_PositionalError>\n" +
"        <errorZCA_PositionalError uom=\"#m\">0.0</errorZCA_PositionalError>\n" +
"        <errorXYCA_PositionalError uom=\"#m\">0.0</errorXYCA_PositionalError>\n" +
"        <errorXYZCA_PositionalError uom=\"#m\">0.0</errorXYZCA_PositionalError>\n" +
"        <pointTypeCA_PositionalError>controlPoint</pointTypeCA_PositionalError>\n" +
"        <errorTypeCA_PositionalError>standardDeviation</errorTypeCA_PositionalError>\n" +
"        <quantityTypeCA_PositionalError>minimum</quantityTypeCA_PositionalError>\n" +
"    </CA_PositionalError>\n" +
"    <CA_RadialDistortion>\n" +
"        <numberCoefficients>0</numberCoefficients>\n" +
"        <k>0.0</k>\n" +
"    </CA_RadialDistortion>\n" +
"    <CA_Radiation>\n" +
```

```
"       <solarZenithAngle uom=\"#m\">0.0</solarZenithAngle>\n" +
"       <solarAzimuth uom=\"#m\">0.0</solarAzimuth>\n" +
"       <atmosphericConditionCA_Radiation>general description of the status of the
atmosphere during the calibration</atmosphericConditionCA_Radiation>\n" +
"       <atmosphericModelCA_Radiation>characterization of the atmospheric
model</atmosphericModelCA_Radiation>\n" +
"       <modelType>\n" +
"           <CI_CitationCA_Radiation>\n" +
"               <titleCA_Radiation>name by which the cited resource is
known</titleCA_Radiation>\n" +
"               <alternateTitleCA_Radiation>short name or other language name by which the
cited information is known</alternateTitleCA_Radiation>\n" +
"               <dateCA_Radiation>\n" +
"                   <CI_DateCA_Radiation>\n" +
"                       <dateCI_DateCA_Radiation>01-09-2015</dateCI_DateCA_Radiation>\n" +
"                       <dateTypeCA_Radiation>creation</dateTypeCA_Radiation>\n" +
"                   </CI_DateCA_Radiation>\n" +
"               </dateCA_Radiation>\n" +
"               <editionCA_Radiation>version of the cited resource</editionCA_Radiation>\n" +
"               <editionDateCA_Radiation>\n" +
"                   <dateEditionDateCA_Radiation>01-09-2015</dateEditionDateCA_Radiation>\n" +
"               </editionDateCA_Radiation>\n" +
"               <identifierCA_Radiation>\n" +
"                   <MD_IdentifierCA_Radiation>\n" +
"                       <authorityCA_Radiation>person or party responsible for maintenance
of the namespace</authorityCA_Radiation>\n" +
"                       <codeCA_Radiation>alphanumeric value identifying an instance in the
namespace</codeCA_Radiation>\n" +
"                   </MD_IdentifierCA_Radiation>\n" +
"               </identifierCA_Radiation>\n" +
"               <citedResponsiblePartyCA_Radiation>\n" +
"                   <CI_ResponsiblePartyCA_Radiation>\n" +
"                       <individualNameCA_Radiation>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameCA_Radiation>\n" +
"                       <organisationNameCA_Radiation>name of the responsible
organization</organisationNameCA_Radiation>\n" +
"                       <positionNameCA_Radiation>role or position of the responsible
person</positionNameCA_Radiation>\n" +
"                       <contactInfoCA_Radiation>\n" +
"                           <CI_ContactCA_Radiation>\n" +
"                               <phoneCA_Radiation>\n" +
"                                   <CI_TelephoneCA_Radiation>\n" +
"                                       <voiceCA_Radiation>telephone number by which
individuals can speak to the responsible organization or individual</voiceCA_Radiation>\n" +
"                                       <facsimileCA_Radiation>telephone number of a
facsimile machine for the responsible organization or individual</facsimileCA_Radiation>\n" +
"                                   </CI_TelephoneCA_Radiation>\n" +
"                               </phoneCA_Radiation>\n" +
"                               <addressCA_Radiation>\n" +
"                                   <CI_AddressCA_Radiation>\n" +
"                                       <deliveryPointCA_Radiation>address line for the
location</deliveryPointCA_Radiation>\n" +
"                                       <cityCA_Radiation>city of the
location</cityCA_Radiation>\n" +
"                                       <administrativeAreaCA_Radiation>state, province of
the location</administrativeAreaCA_Radiation>\n" +
"                                       <postalCodeCA_Radiation>ZIP or other postal
code</postalCodeCA_Radiation>\n" +
"                                       <countryCA_Radiation>country of the physical
address</countryCA_Radiation>\n" +
"                                       <electronicMailAddressCA_Radiation>telephone number
of a facsimile machine for the responsible organization or
individual</electronicMailAddressCA_Radiation>\n" +
"                                   </CI_AddressCA_Radiation>\n" +
"                               </addressCA_Radiation>\n" +
"                               <onlineResourceCA_Radiation>\n" +
"                                   <CI_OnlineResourceCA_Radiation>\n" +
```

```
"                                        <linkageCA_Radiation>location (address) for on-line
access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_Radiation>\n" +
"                                        <protocolCA_Radiation>connection protocol to be
used</protocolCA_Radiation>\n" +
"                                        <applicationProfileCA_Radiation>name of an
application profile that can be used with the online
resource</applicationProfileCA_Radiation>\n" +
"                                        <nameCI_OnlineResourceCA_Radiation>name of the
online resource</nameCI_OnlineResourceCA_Radiation>\n" +
"                                        <descriptionCI_OnlineResourceCA_Radiation>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceCA_Radiation>\n" +
"
<functionCA_Radiation>download</functionCA_Radiation>\n" +
"                                    </CI_OnlineResourceCA_Radiation>\n" +
"                                </onlineResourceCA_Radiation>\n" +
"                                <hoursOfServiceCA_Radiation>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceCA_Radiation>\n" +
"                                <contactInstructionsCA_Radiation>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsCA_Radiation>\n" +
"                            </CI_ContactCA_Radiation>\n" +
"                        </contactInfoCA_Radiation>\n" +
"                        <roleCA_Radiation>resourceProvider</roleCA_Radiation>\n" +
"                    </CI_ResponsiblePartyCA_Radiation>\n" +
"                </citedResponsiblePartyCA_Radiation>\n" +
"
<presentationFormCA_Radiation>documentDigital</presentationFormCA_Radiation>\n" +
"                <seriesCA_Radiation>\n" +
"                    <CI_SeriesCA_Radiation>\n" +
"                        <nameCI_SeriesCA_Radiation>name of the series, or aggregate dataset,
of which the dataset is a part</nameCI_SeriesCA_Radiation>\n" +
"                        <issueIdentificationCA_Radiation>information identifying the issue
of the series</issueIdentificationCA_Radiation>\n" +
"                        <pageCA_Radiation>details on which pages of the publication the
article was published</pageCA_Radiation>\n" +
"                    </CI_SeriesCA_Radiation>\n" +
"                </seriesCA_Radiation>\n" +
"                <otherCitationDetailsCA_Radiation>other information required to complete the
citation that is not recorded elsewhere</otherCitationDetailsCA_Radiation>\n" +
"                <collectiveTitleCA_Radiation>common title with holdings
note</collectiveTitleCA_Radiation>\n" +
"                <ISBNCA_Radiation>international Standard Book Number</ISBNCA_Radiation>\n" +
"                <ISSNCA_Radiation>international Standard Serial Number</ISSNCA_Radiation>\n" +
"            </CI_CitationCA_Radiation>\n" +
"        </modelType>\n" +
"        <solarIncidentAngle uom=\"#m\">0.0</solarIncidentAngle>\n" +
"        <solarIrradiance>smith_and_gottlieb_1974</solarIrradiance>\n" +
"    </CA_Radiation> \n" +
"    <CA_RadiometricDynamics>\n" +
"        <bit>1</bit>\n" +
"    </CA_RadiometricDynamics>\n" +
"    <CA_RadiometryInFlight>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>\n" +
"        <lampType>type of illumination used</lampType>\n" +
"        <atmosphericConditionCA_RadiometryInFlight>state of the
atmosphere</atmosphericConditionCA_RadiometryInFlight>\n" +
"        <aerosolQuantity>0.0</aerosolQuantity>\n" +
"    </CA_RadiometryInFlight>\n" +
"    <CA_RadiometryInSensor>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <case>1</case>\n" +
"        <numberOfPieces>0</numberOfPieces>\n" +
"        <gain>0.0</gain>\n" +
```

```
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                           </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                       </phoneCA_RadiometryInSensor>\n" +
"                                       <addressCA_RadiometryInSensor>\n" +
"                                           <CI_AddressCA_RadiometryInSensor>\n" +
"                                               <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                               <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                               <postalCodeCA_RadiometryInSensor>ZIP or
```

```
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
```

```
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"               <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"               <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"               <pointOfContactCA_RadiometryInSensor>\n" +
"                   <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                       <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                       <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                       <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                       <contactInfoCA_RadiometryInSensor1>\n" +
"                           <CI_ContactCA_RadiometryInSensor1>\n" +
"                               <phoneCA_RadiometryInSensor1>\n" +
"                                   <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                       <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                       <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                   </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                               </phoneCA_RadiometryInSensor1>\n" +
"                               <addressCA_RadiometryInSensor1>\n" +
"                                   <CI_AddressCA_RadiometryInSensor1>\n" +
"                                       <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                       <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                       <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                       <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                       <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                   </CI_AddressCA_RadiometryInSensor1>\n" +
"                               </addressCA_RadiometryInSensor1>\n" +
"                               <onlineResourceCA_RadiometryInSensor1>\n" +
"                                   <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                       <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                       <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                       <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                       <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                   </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                               </onlineResourceCA_RadiometryInSensor1>\n" +
"                               <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                               <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
```

```
"                           </CI_ContactCA_RadiometryInSensor1>\n" +
"                       </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                   </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"               </pointOfContactCA_RadiometryInSensor>\n" +
"           </MD_IdentificationCA_RadiometryInSensor >      \n" +
"       </sensorSystemIdentification>\n" +
"   </CA_RadiometryInSensor>\n" +
"   <CA_RadiometryLaboratory>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>\n" +
"       <calibrationMethod>integratingSphere</calibrationMethod>\n" +
"   </CA_RadiometryLaboratory>\n" +
"   <CA_RadiometryOffSensor>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <atmosphericModelCA_RadiometryOffSensor>model that is applied for the atmospheric
correction</atmosphericModelCA_RadiometryOffSensor>\n" +
"       <modelProperties>general description of the atmospheric model</modelProperties>\n" +
"       <method>darkPixelSubtractionMethod</method>\n" +
"       <illumination>definition of the light conditions of the imaged
object</illumination>\n" +
"       <pathRadiance>0.0</pathRadiance>\n" +
"       <backgroundRadiance>0.0</backgroundRadiance>\n" +
"       <skylight>0.0</skylight>\n" +
"       <skylightReflected>0.0</skylightReflected>\n" +
"   </CA_RadiometryOffSensor>\n" +
"   <CA_RadiometryPreCorrection>\n" +
"       <resamplingDateCA_RadiometryPreCorrection>1-09-2015
12:00:00</resamplingDateCA_RadiometryPreCorrection>\n" +
"       <tonalAdjustmentType>gammaCorrection</tonalAdjustmentType>\n" +
"       <gammaCorrection>0.0</gammaCorrection>\n" +
"       <radiometricTransformation>16To8Bit</radiometricTransformation>\n" +
"       <lookUpTable>\n" +
"           <CA_LUT>\n" +
"               <identification>Characterization of the LUT</identification>\n" +
"               <in>0</in>\n" +
"               <out>0</out>\n" +
"           </CA_LUT>\n" +
"       </lookUpTable>\n" +
"       <filterType>\n" +
"           <CI_CitationCA_RadiometryPreCorrection>\n" +
"               <titleCA_RadiometryPreCorrection>name by which the cited resource is
known</titleCA_RadiometryPreCorrection>\n" +
"               <alternateTitleCA_RadiometryPreCorrection>short name or other language name
by which the cited information is known</alternateTitleCA_RadiometryPreCorrection>\n" +
"               <dateCA_RadiometryPreCorrection>\n" +
"                   <CI_DateCA_RadiometryPreCorrection>\n" +
"
<dateCI_DateCA_RadiometryPreCorrection>1-09-2015</dateCI_DateCA_RadiometryPreCorrection>\n" +
"
<dateTypeCA_RadiometryPreCorrection>creation</dateTypeCA_RadiometryPreCorrection>\n" +
"                   </CI_DateCA_RadiometryPreCorrection>\n" +
"               </dateCA_RadiometryPreCorrection>\n" +
"               <editionCA_RadiometryPreCorrection>version of the cited
resource</editionCA_RadiometryPreCorrection>\n" +
"               <editionDateCA_RadiometryPreCorrection>\n" +
"
```

```
<dateEditionDateCA_RadiometryPreCorrection>1-09-2015</dateEditionDateCA_RadiometryPreCorrectio
n>\n" +
"               </editionDateCA_RadiometryPreCorrection>\n" +
"               <identifierCA_RadiometryPreCorrection>\n" +
"                   <MD_IdentifierCA_RadiometryPreCorrection>\n" +
"                       <authorityCA_RadiometryPreCorrection>person or party responsible for
maintenance of the namespace</authorityCA_RadiometryPreCorrection>\n" +
"                       <codeCA_RadiometryPreCorrection>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryPreCorrection>\n" +
"                   </MD_IdentifierCA_RadiometryPreCorrection>\n" +
"               </identifierCA_RadiometryPreCorrection>\n" +
"               <citedResponsiblePartyCA_RadiometryPreCorrection>\n" +
"                   <CI_ResponsiblePartyCA_RadiometryPreCorrection>\n" +
"                       <individualNameCA_RadiometryPreCorrection>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryPreCorrection>\n" +
"                       <organisationNameCA_RadiometryPreCorrection>name of the responsible
organization</organisationNameCA_RadiometryPreCorrection>\n" +
"                       <positionNameCA_RadiometryPreCorrection>role or position of the
responsible person</positionNameCA_RadiometryPreCorrection>\n" +
"                       <contactInfoCA_RadiometryPreCorrection>\n" +
"                           <CI_ContactCA_RadiometryPreCorrection>\n" +
"                               <phoneCA_RadiometryPreCorrection>\n" +
"                                   <CI_TelephoneCA_RadiometryPreCorrection>\n" +
"                                       <voiceCA_RadiometryPreCorrection>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryPreCorrection>\n" +
"                                       <facsimileCA_RadiometryPreCorrection>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryPreCorrection>\n" +
"                                   </CI_TelephoneCA_RadiometryPreCorrection>\n" +
"                               </phoneCA_RadiometryPreCorrection>\n" +
"                               <addressCA_RadiometryPreCorrection>\n" +
"                                   <CI_AddressCA_RadiometryPreCorrection>\n" +
"                                       <deliveryPointCA_RadiometryPreCorrection>address
line for the location</deliveryPointCA_RadiometryPreCorrection>\n" +
"                                       <cityCA_RadiometryPreCorrection>city of the
location</cityCA_RadiometryPreCorrection>\n" +
"                                       <administrativeAreaCA_RadiometryPreCorrection>state,
province of the location</administrativeAreaCA_RadiometryPreCorrection>\n" +
"                                       <postalCodeCA_RadiometryPreCorrection>ZIP or other
postal code</postalCodeCA_RadiometryPreCorrection>\n" +
"                                       <countryCA_RadiometryPreCorrection>country of the
physical address</countryCA_RadiometryPreCorrection>\n" +
"
<electronicMailAddressCA_RadiometryPreCorrection>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_RadiometryPreCorrection>\n" +
"                                   </CI_AddressCA_RadiometryPreCorrection>\n" +
"                               </addressCA_RadiometryPreCorrection>\n" +
"                               <onlineResourceCA_RadiometryPreCorrection>\n" +
"                                   <CI_OnlineResourceCA_RadiometryPreCorrection>\n" +
"                                       <linkageCA_RadiometryPreCorrection>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryPreCorrection>\n" +
"                                       <protocolCA_RadiometryPreCorrection>connection
protocol to be used</protocolCA_RadiometryPreCorrection>\n" +
"                                       <applicationProfileCA_RadiometryPreCorrection>name
of an application profile that can be used with the online
resource</applicationProfileCA_RadiometryPreCorrection>\n" +
"
<nameCI_OnlineResourceCA_RadiometryPreCorrection>name of the online
resource</nameCI_OnlineResourceCA_RadiometryPreCorrection>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryPreCorrection>detailed text description of what
the online resource is/does</descriptionCI_OnlineResourceCA_RadiometryPreCorrection>\n" +
"
```

```
<functionCA_RadiometryPreCorrection>download</functionCA_RadiometryPreCorrection>\n" +
"                                    </CI_OnlineResourceCA_RadiometryPreCorrection>\n" +
"                                </onlineResourceCA_RadiometryPreCorrection>\n" +
"                                <hoursOfServiceCA_RadiometryPreCorrection>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryPreCorrection>\n" +
"                                <contactInstructionsCA_RadiometryPreCorrection>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryPreCorrection>\n" +
"                            </CI_ContactCA_RadiometryPreCorrection>\n" +
"                        </contactInfoCA_RadiometryPreCorrection>\n" +
"
<roleCA_RadiometryPreCorrection>resourceProvider</roleCA_RadiometryPreCorrection>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryPreCorrection>\n" +
"                </citedResponsiblePartyCA_RadiometryPreCorrection>\n" +
"
<presentationFormCA_RadiometryPreCorrection>documentDigital</presentationFormCA_RadiometryPreC
orrection>\n" +
"                <seriesCA_RadiometryPreCorrection>\n" +
"                    <CI_SeriesCA_RadiometryPreCorrection>\n" +
"                        <nameCI_SeriesCA_RadiometryPreCorrection>name of the series, or
aggregate dataset, of which the dataset is a
part</nameCI_SeriesCA_RadiometryPreCorrection>\n" +
"                        <issueIdentificationCA_RadiometryPreCorrection>information
identifying the issue of the series</issueIdentificationCA_RadiometryPreCorrection>\n" +
"                        <pageCA_RadiometryPreCorrection>details on which pages of the
publication the article was published</pageCA_RadiometryPreCorrection>\n" +
"                    </CI_SeriesCA_RadiometryPreCorrection>\n" +
"                </seriesCA_RadiometryPreCorrection>\n" +
"                <otherCitationDetailsCA_RadiometryPreCorrection>other information required
to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryPreCorrection>\n" +
"                <collectiveTitleCA_RadiometryPreCorrection>common title with holdings
note</collectiveTitleCA_RadiometryPreCorrection>\n" +
"                <ISBNCA_RadiometryPreCorrection>international Standard Book
Number</ISBNCA_RadiometryPreCorrection>\n" +
"                <ISSNCA_RadiometryPreCorrection>international Standard Serial
Number</ISSNCA_RadiometryPreCorrection>\n" +
"            </CI_CitationCA_RadiometryPreCorrection>        \n" +
"        </filterType>\n" +
"        <parametersCA_RadiometryPreCorrection>0.0</parametersCA_RadiometryPreCorrection>\n" +
"    </CA_RadiometryPreCorrection>\n" +
"    <CA_RadiometryTestRange>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <radiometricCalibrationDate>1-09-2015 12:00:00</radiometricCalibrationDate>\n" +
"        <lampType>type of illumination used</lampType>\n" +
"        <atmosphericConditionCA_RadiometryInFlight>state of the
atmosphere</atmosphericConditionCA_RadiometryInFlight>\n" +
"        <aerosolQuantity>0.0</aerosolQuantity>\n" +
"        <numberPoints>0</numberPoints>\n" +
"        <controlPointCA_RadiometryTestRange>0.0</controlPointCA_RadiometryTestRange>\n" +
"        <expanse uom=\"#m\">0.0</expanse>\n" +
"        <minimumElevationCA_RadiometryTestRange
uom=\"#m\">0.0</minimumElevationCA_RadiometryTestRange> \n" +
"        <maximumElevationCA_RadiometryTestRange
uom=\"#m\">0.0</maximumElevationCA_RadiometryTestRange>\n" +
"        <averageElevationCA_RadiometryTestRange
uom=\"#m\">0.0</averageElevationCA_RadiometryTestRange> \n" +
"    </CA_RadiometryTestRange>\n" +
"    <CA_RadiometryValidation>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <rmseComparisonObject>0.0</rmseComparisonObject>\n" +
"        <validationTimeCA_RadiometryValidation>0-0-0
00:00:00</validationTimeCA_RadiometryValidation>\n" +
"    </CA_RadiometryValidation>\n" +
"    <CA_SensorCharacteristics>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
```

```
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                           </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                       </phoneCA_RadiometryInSensor>\n" +
"                                       <addressCA_RadiometryInSensor>\n" +
"                                           <CI_AddressCA_RadiometryInSensor>\n" +
"                                               <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                               <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
```

```
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
```

```
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
```

```
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"        <sensorIdentification>\n" +
"            <MD_IdentificationCA_SensorCharacteristics>\n" +
"                <citationCA_SensorCharacteristics>\n" +
"                    <CI_CitationCA_SensorCharacteristics>\n" +
"                        <titleCA_SensorCharacteristics>name by which the cited resource is
known</titleCA_SensorCharacteristics>\n" +
"                        <alternateTitleCA_SensorCharacteristics>short name or other language
name by which the cited information is known</alternateTitleCA_SensorCharacteristics>\n" +
"                        <dateCA_SensorCharacteristics>\n" +
"                            <CI_DateCA_SensorCharacteristics>\n" +
"
<dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA_SensorCharacteristics>\n" +
"
<dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorCharacteristics>\n" +
"                            </CI_DateCA_SensorCharacteristics>\n" +
"                        </dateCA_SensorCharacteristics>\n" +
"                        <editionCA_SensorCharacteristics>version of the cited
resource</editionCA_SensorCharacteristics>\n" +
"                        <editionDateCA_SensorCharacteristics>\n" +
"
<dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDateCA_SensorCharacteristics>\
n" +
"                        </editionDateCA_SensorCharacteristics>\n" +
"                        <identifierCA_SensorCharacteristics>\n" +
"                            <MD_IdentifierCA_SensorCharacteristics>\n" +
"                                <authorityCA_SensorCharacteristics>person or party
responsible for maintenance of the namespace</authorityCA_SensorCharacteristics>\n" +
"                                <codeCA_SensorCharacteristics>alphanumeric value identifying
an instance in the namespace</codeCA_SensorCharacteristics>\n" +
"                            </MD_IdentifierCA_SensorCharacteristics>\n" +
"                        </identifierCA_SensorCharacteristics>\n" +
"                        <citedResponsiblePartyCA_SensorCharacteristics>\n" +
"                            <CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                                <individualNameCA_SensorCharacteristics>name of the
responsible person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics>\n" +
"                                <organisationNameCA_SensorCharacteristics>name of the
responsible organization</organisationNameCA_SensorCharacteristics>\n" +
"                                <positionNameCA_SensorCharacteristics>role or position of
the responsible person</positionNameCA_SensorCharacteristics>\n" +
"                                <contactInfoCA_SensorCharacteristics>\n" +
"                                    <CI_ContactCA_SensorCharacteristics>\n" +
"                                        <phoneCA_SensorCharacteristics>\n" +
"                                            <CI_TelephoneCA_SensorCharacteristics>\n" +
"                                                <voiceCA_SensorCharacteristics>telephone
number by which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics>\n" +
"                                                <facsimileCA_SensorCharacteristics>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics>\n" +
"                                            </CI_TelephoneCA_SensorCharacteristics>\n" +
"                                        </phoneCA_SensorCharacteristics>\n" +
"                                        <addressCA_SensorCharacteristics>\n" +
"                                            <CI_AddressCA_SensorCharacteristics>\n" +
"
```

```
<deliveryPointCA_SensorCharacteristics>address line for the
location</deliveryPointCA_SensorCharacteristics>\n" +
"                                                <cityCA_SensorCharacteristics>city of the
location</cityCA_SensorCharacteristics>\n" +
"
<administrativeAreaCA_SensorCharacteristics>state, province of the
location</administrativeAreaCA_SensorCharacteristics>\n" +
"                                                <postalCodeCA_SensorCharacteristics>ZIP or
other postal code</postalCodeCA_SensorCharacteristics>\n" +
"                                                <countryCA_SensorCharacteristics>country of
the physical address</countryCA_SensorCharacteristics>\n" +
"
<electronicMailAddressCA_SensorCharacteristics>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics>\n" +
"                                            </CI_AddressCA_SensorCharacteristics>\n" +
"                                        </addressCA_SensorCharacteristics>\n" +
"                                        <onlineResourceCA_SensorCharacteristics>\n" +
"                                            <CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                                <linkageCA_SensorCharacteristics>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics>\n" +
"                                                <protocolCA_SensorCharacteristics>connection
protocol to be used</protocolCA_SensorCharacteristics>\n" +
"
<applicationProfileCA_SensorCharacteristics>name of an application profile that can be used
with the online resource</applicationProfileCA_SensorCharacteristics>\n" +
"
<nameCI_OnlineResourceCA_SensorCharacteristics>name of the online
resource</nameCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<functionCA_SensorCharacteristics>download</functionCA_SensorCharacteristics>\n" +
"                                            </CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                        </onlineResourceCA_SensorCharacteristics>\n" +
"                                        <hoursOfServiceCA_SensorCharacteristics>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics>\n" +
"
<contactInstructionsCA_SensorCharacteristics>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_SensorCharacteristics>\n" +
"                                    </CI_ContactCA_SensorCharacteristics>\n" +
"                                </contactInfoCA_SensorCharacteristics>\n" +
"
<roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorCharacteristics>\n" +
"                            </CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                        </citedResponsiblePartyCA_SensorCharacteristics>\n" +
"
<presentationFormCA_SensorCharacteristics>documentDigital</presentationFormCA_SensorCharacteri
stics>\n" +
"                        <seriesCA_SensorCharacteristics>\n" +
"                            <CI_SeriesCA_SensorCharacteristics>\n" +
"                                <nameCI_SeriesCA_SensorCharacteristics>name of the series,
or aggregate dataset, of which the dataset is a
part</nameCI_SeriesCA_SensorCharacteristics>\n" +
"                                <issueIdentificationCA_SensorCharacteristics>information
identifying the issue of the series</issueIdentificationCA_SensorCharacteristics>\n" +
"                                <pageCA_SensorCharacteristics>details on which pages of the
publication the article was published</pageCA_SensorCharacteristics>\n" +
"                            </CI_SeriesCA_SensorCharacteristics>\n" +
"                        </seriesCA_SensorCharacteristics>\n" +
"                        <otherCitationDetailsCA_SensorCharacteristics>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_SensorCharacteristics>\n" +
"                        <collectiveTitleCA_SensorCharacteristics>common title with holdings
```

```
note</collectiveTitleCA_SensorCharacteristics>\n" +
"                        <ISBNCA_SensorCharacteristics>international Standard Book
Number</ISBNCA_SensorCharacteristics>\n" +
"                        <ISSNCA_SensorCharacteristics>international Standard Serial
Number</ISSNCA_SensorCharacteristics>\n" +
"                    </CI_CitationCA_SensorCharacteristics>\n" +
"                </citationCA_SensorCharacteristics>\n" +
"                <abstractCA_SensorCharacteristics>brief narrative summary of the content of
the resource(s)</abstractCA_SensorCharacteristics>\n" +
"                <purposeCA_SensorCharacteristics>summary of the intentions with which the
resource(s) was developed</purposeCA_SensorCharacteristics>\n" +
"                <creditCA_SensorCharacteristics>recognition of those who contributed to the
resource(s)</creditCA_SensorCharacteristics>\n" +
"
<statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>\n" +
"                <pointOfContactCA_SensorCharacteristics>\n" +
"                    <CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                        <individualNameCA_SensorCharacteristics1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics1>\n" +
"                        <organisationNameCA_SensorCharacteristics1>name of the responsible
organization</organisationNameCA_SensorCharacteristics1>\n" +
"                        <positionNameCA_SensorCharacteristics1>role or position of the
responsible person</positionNameCA_SensorCharacteristics1>\n" +
"                        <contactInfoCA_SensorCharacteristics1>\n" +
"                            <CI_ContactCA_SensorCharacteristics1>\n" +
"                                <phoneCA_SensorCharacteristics1>\n" +
"                                    <CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                        <voiceCA_SensorCharacteristics1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics1>\n" +
"                                        <facsimileCA_SensorCharacteristics1>telephone number
of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics1>\n" +
"                                    </CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                </phoneCA_SensorCharacteristics1>\n" +
"                                <addressCA_SensorCharacteristics1>\n" +
"                                    <CI_AddressCA_SensorCharacteristics1>\n" +
"                                        <deliveryPointCA_SensorCharacteristics1>address line
for the location</deliveryPointCA_SensorCharacteristics1>\n" +
"                                        <cityCA_SensorCharacteristics1>city of the
location</cityCA_SensorCharacteristics1>\n" +
"                                        <administrativeAreaCA_SensorCharacteristics1>state,
province of the location</administrativeAreaCA_SensorCharacteristics1>\n" +
"                                        <postalCodeCA_SensorCharacteristics1>ZIP or other
postal code</postalCodeCA_SensorCharacteristics1>\n" +
"                                        <countryCA_SensorCharacteristics1>country of the
physical address</countryCA_SensorCharacteristics1>\n" +
"
<electronicMailAddressCA_SensorCharacteristics1>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics1>\n" +
"                                    </CI_AddressCA_SensorCharacteristics1>\n" +
"                                </addressCA_SensorCharacteristics1>\n" +
"                                <onlineResourceCA_SensorCharacteristics1>\n" +
"                                    <CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                        <linkageCA_SensorCharacteristics1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics1>\n" +
"                                        <protocolCA_SensorCharacteristics1>connection
protocol to be used</protocolCA_SensorCharacteristics1>\n" +
"                                        <applicationProfileCA_SensorCharacteristics1>name of
an application profile that can be used with the online
resource</applicationProfileCA_SensorCharacteristics1>\n" +
"                                        <nameCI_OnlineResourceCA_SensorCharacteristics1>name
of the online resource</nameCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
```

```
<descriptionCI_OnlineResourceCA_SensorCharacteristics1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<functionCA_SensorCharacteristics1>download</functionCA_SensorCharacteristics1>\n" +
"                                    </CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                </onlineResourceCA_SensorCharacteristics1>\n" +
"                                <hoursOfServiceCA_SensorCharacteristics1>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics1>\n" +
"                                <contactInstructionsCA_SensorCharacteristics1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_SensorCharacteristics1>\n" +
"                            </CI_ContactCA_SensorCharacteristics1>\n" +
"                        </contactInfoCA_SensorCharacteristics1>\n" +
"
<roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacteristics1>\n" +
"                    </CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                </pointOfContactCA_SensorCharacteristics>\n" +
"            </MD_IdentificationCA_SensorCharacteristics>        \n" +
"       </sensorIdentification>\n" +
"       <cameraHead>camera or sensor head for which the information is valid</cameraHead>\n" +
"       <channel>channel for which the information is valid</channel>\n" +
"   </CA_SensorCharacteristics>\n" +
"   <CA_SensorDefects>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
```

```
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                                <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                                <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                                <contactInfoCA_RadiometryInSensor>\n" +
"                                    <CI_ContactCA_RadiometryInSensor>\n" +
"                                        <phoneCA_RadiometryInSensor>\n" +
"                                            <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                                <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                                <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
```

```
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
```

```
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"        <sensorIdentification>\n" +
"            <MD_IdentificationCA_SensorCharacteristics>\n" +
"                <citationCA_SensorCharacteristics>\n" +
"                    <CI_CitationCA_SensorCharacteristics>\n" +
"                        <titleCA_SensorCharacteristics>name by which the cited resource is
known</titleCA_SensorCharacteristics>\n" +
"                        <alternateTitleCA_SensorCharacteristics>short name or other language
name by which the cited information is known</alternateTitleCA_SensorCharacteristics>\n" +
"                        <dateCA_SensorCharacteristics>\n" +
"                            <CI_DateCA_SensorCharacteristics>\n" +
"
<dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA_SensorCharacteristics>\n" +
"
<dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorCharacteristics>\n" +
"                            </CI_DateCA_SensorCharacteristics>\n" +
"                        </dateCA_SensorCharacteristics>\n" +
"                        <editionCA_SensorCharacteristics>version of the cited
resource</editionCA_SensorCharacteristics>\n" +
"                        <editionDateCA_SensorCharacteristics>\n" +
"
<dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDateCA_SensorCharacteristics>\
n" +
"                        </editionDateCA_SensorCharacteristics>\n" +
"                        <identifierCA_SensorCharacteristics>\n" +
"                            <MD_IdentifierCA_SensorCharacteristics>\n" +
"                                <authorityCA_SensorCharacteristics>person or party
responsible for maintenance of the namespace</authorityCA_SensorCharacteristics>\n" +
"                                <codeCA_SensorCharacteristics>alphanumeric value identifying
an instance in the namespace</codeCA_SensorCharacteristics>\n" +
"                            </MD_IdentifierCA_SensorCharacteristics>\n" +
```

```
"                        </identifierCA_SensorCharacteristics>\n" +
"                        <citedResponsiblePartyCA_SensorCharacteristics>\n" +
"                            <CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                                <individualNameCA_SensorCharacteristics>name of the
responsible person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics>\n" +
"                                <organisationNameCA_SensorCharacteristics>name of the
responsible organization</organisationNameCA_SensorCharacteristics>\n" +
"                                <positionNameCA_SensorCharacteristics>role or position of
the responsible person</positionNameCA_SensorCharacteristics>\n" +
"                                <contactInfoCA_SensorCharacteristics>\n" +
"                                    <CI_ContactCA_SensorCharacteristics>\n" +
"                                        <phoneCA_SensorCharacteristics>\n" +
"                                            <CI_TelephoneCA_SensorCharacteristics>\n" +
"                                                <voiceCA_SensorCharacteristics>telephone
number by which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics>\n" +
"                                                <facsimileCA_SensorCharacteristics>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics>\n" +
"                                            </CI_TelephoneCA_SensorCharacteristics>\n" +
"                                        </phoneCA_SensorCharacteristics>\n" +
"                                        <addressCA_SensorCharacteristics>\n" +
"                                            <CI_AddressCA_SensorCharacteristics>\n" +
"
<deliveryPointCA_SensorCharacteristics>address line for the
location</deliveryPointCA_SensorCharacteristics>\n" +
"                                                <cityCA_SensorCharacteristics>city of the
location</cityCA_SensorCharacteristics>\n" +
"
<administrativeAreaCA_SensorCharacteristics>state, province of the
location</administrativeAreaCA_SensorCharacteristics>\n" +
"                                                <postalCodeCA_SensorCharacteristics>ZIP or
other postal code</postalCodeCA_SensorCharacteristics>\n" +
"                                                <countryCA_SensorCharacteristics>country of
the physical address</countryCA_SensorCharacteristics>\n" +
"
<electronicMailAddressCA_SensorCharacteristics>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics>\n" +
"                                            </CI_AddressCA_SensorCharacteristics>\n" +
"                                        </addressCA_SensorCharacteristics>\n" +
"                                        <onlineResourceCA_SensorCharacteristics>\n" +
"                                            <CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                                <linkageCA_SensorCharacteristics>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics>\n" +
"                                                <protocolCA_SensorCharacteristics>connection
protocol to be used</protocolCA_SensorCharacteristics>\n" +
"
<applicationProfileCA_SensorCharacteristics>name of an application profile that can be used
with the online resource</applicationProfileCA_SensorCharacteristics>\n" +
"
<nameCI_OnlineResourceCA_SensorCharacteristics>name of the online
resource</nameCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<functionCA_SensorCharacteristics>download</functionCA_SensorCharacteristics>\n" +
"                                            </CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                        </onlineResourceCA_SensorCharacteristics>\n" +
"                                        <hoursOfServiceCA_SensorCharacteristics>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics>\n" +
"
<contactInstructionsCA_SensorCharacteristics>supplemental instructions on how or when to
```

```
contact the individual or organization</contactInstructionsCA_SensorCharacteristics>\n" +
"                                    </CI_ContactCA_SensorCharacteristics>\n" +
"                                </contactInfoCA_SensorCharacteristics>\n" +
"
<roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorCharacteristics>\n" +
"                            </CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                        </citedResponsiblePartyCA_SensorCharacteristics>\n" +
"
<presentationFormCA_SensorCharacteristics>documentDigital</presentationFormCA_SensorCharacteri
stics>\n" +
"                        <seriesCA_SensorCharacteristics>\n" +
"                            <CI_SeriesCA_SensorCharacteristics>\n" +
"                                <nameCI_SeriesCA_SensorCharacteristics>name of the series,
or aggregate dataset, of which the dataset is a
part</nameCI_SeriesCA_SensorCharacteristics>\n" +
"                                <issueIdentificationCA_SensorCharacteristics>information
identifying the issue of the series</issueIdentificationCA_SensorCharacteristics>\n" +
"                                <pageCA_SensorCharacteristics>details on which pages of the
publication the article was published</pageCA_SensorCharacteristics>\n" +
"                            </CI_SeriesCA_SensorCharacteristics>\n" +
"                        </seriesCA_SensorCharacteristics>\n" +
"                        <otherCitationDetailsCA_SensorCharacteristics>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_SensorCharacteristics>\n" +
"                        <collectiveTitleCA_SensorCharacteristics>common title with holdings
note</collectiveTitleCA_SensorCharacteristics>\n" +
"                        <ISBNCA_SensorCharacteristics>international Standard Book
Number</ISBNCA_SensorCharacteristics>\n" +
"                        <ISSNCA_SensorCharacteristics>international Standard Serial
Number</ISSNCA_SensorCharacteristics>\n" +
"                    </CI_CitationCA_SensorCharacteristics>\n" +
"                </citationCA_SensorCharacteristics>\n" +
"                <abstractCA_SensorCharacteristics>brief narrative summary of the content of
the resource(s)</abstractCA_SensorCharacteristics>\n" +
"                <purposeCA_SensorCharacteristics>summary of the intentions with which the
resource(s) was developed</purposeCA_SensorCharacteristics>\n" +
"                <creditCA_SensorCharacteristics>recognition of those who contributed to the
resource(s)</creditCA_SensorCharacteristics>\n" +
"
<statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>\n" +
"                <pointOfContactCA_SensorCharacteristics>\n" +
"                    <CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                        <individualNameCA_SensorCharacteristics1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics1>\n" +
"                        <organisationNameCA_SensorCharacteristics1>name of the responsible
organization</organisationNameCA_SensorCharacteristics1>\n" +
"                        <positionNameCA_SensorCharacteristics1>role or position of the
responsible person</positionNameCA_SensorCharacteristics1>\n" +
"                        <contactInfoCA_SensorCharacteristics1>\n" +
"                            <CI_ContactCA_SensorCharacteristics1>\n" +
"                                <phoneCA_SensorCharacteristics1>\n" +
"                                    <CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                        <voiceCA_SensorCharacteristics1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics1>\n" +
"                                        <facsimileCA_SensorCharacteristics1>telephone number
of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics1>\n" +
"                                    </CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                </phoneCA_SensorCharacteristics1>\n" +
"                                <addressCA_SensorCharacteristics1>\n" +
"                                    <CI_AddressCA_SensorCharacteristics1>\n" +
"                                        <deliveryPointCA_SensorCharacteristics1>address line
for the location</deliveryPointCA_SensorCharacteristics1>\n" +
"                                        <cityCA_SensorCharacteristics1>city of the
location</cityCA_SensorCharacteristics1>\n" +
```

```
"                                        <administrativeAreaCA_SensorCharacteristics1>state,
province of the location</administrativeAreaCA_SensorCharacteristics1>\n" +
"                                        <postalCodeCA_SensorCharacteristics1>ZIP or other
postal code</postalCodeCA_SensorCharacteristics1>\n" +
"                                        <countryCA_SensorCharacteristics1>country of the
physical address</countryCA_SensorCharacteristics1>\n" +
"
<electronicMailAddressCA_SensorCharacteristics1>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics1>\n" +
"                                    </CI_AddressCA_SensorCharacteristics1>\n" +
"                                </addressCA_SensorCharacteristics1>\n" +
"                                <onlineResourceCA_SensorCharacteristics1>\n" +
"                                    <CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                        <linkageCA_SensorCharacteristics1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics1>\n" +
"                                        <protocolCA_SensorCharacteristics1>connection
protocol to be used</protocolCA_SensorCharacteristics1>\n" +
"                                        <applicationProfileCA_SensorCharacteristics1>name of
an application profile that can be used with the online
resource</applicationProfileCA_SensorCharacteristics1>\n" +
"                                        <nameCI_OnlineResourceCA_SensorCharacteristics1>name
of the online resource</nameCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<functionCA_SensorCharacteristics1>download</functionCA_SensorCharacteristics1>\n" +
"                                    </CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                </onlineResourceCA_SensorCharacteristics1>\n" +
"                                <hoursOfServiceCA_SensorCharacteristics1>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics1>\n" +
"                                <contactInstructionsCA_SensorCharacteristics1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_SensorCharacteristics1>\n" +
"                            </CI_ContactCA_SensorCharacteristics1>\n" +
"                        </contactInfoCA_SensorCharacteristics1>\n" +
"
<roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacteristics1>\n" +
"                    </CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                </pointOfContactCA_SensorCharacteristics>\n" +
"            </MD_IdentificationCA_SensorCharacteristics>        \n" +
"       </sensorIdentification>\n" +
"       <cameraHead>camera or sensor head for which the information is valid</cameraHead>\n" +
"       <channel>channel for which the information is valid</channel>\n" +
"       <colourAberration>definition of a geometric bias of the co-registration of the
colour channels</colourAberration>\n" +
"       <strayLight>definition of the amount of stray light of the sensor</strayLight>\n" +
"       <residualPolarization>definition of the non-compensated parts of the
polarization</residualPolarization>\n" +
"       <smile>description of the smile distortion of the optical system</smile>\n" +
"       <keystoneEffect>yes</keystoneEffect>\n" +
"   </CA_SensorDefects>\n" +
"   <CA_SensorMeasurement>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
```

```
"            <MD_IdentificationCA_RadiometryInSensor>\n" +
"                <citationCA_RadiometryInSensor>\n" +
"                    <CI_CitationCA_RadiometryInSensor>\n" +
"                        <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                        <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                        <dateCA_RadiometryInSensor>\n" +
"                            <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                            </CI_DateCA_RadiometryInSensor>\n" +
"                        </dateCA_RadiometryInSensor>\n" +
"                        <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                        <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                        </editionDateCA_RadiometryInSensor>\n" +
"                        <identifierCA_RadiometryInSensor>\n" +
"                            <MD_IdentifierCA_RadiometryInSensor>\n" +
"                                <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                                <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                            </MD_IdentifierCA_RadiometryInSensor>\n" +
"                        </identifierCA_RadiometryInSensor>\n" +
"                        <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                            <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                                <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                                <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                                <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                                <contactInfoCA_RadiometryInSensor>\n" +
"                                    <CI_ContactCA_RadiometryInSensor>\n" +
"                                        <phoneCA_RadiometryInSensor>\n" +
"                                            <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                                <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                                <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
```

```
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
```

```
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                       <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                       <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                       <contactInfoCA_RadiometryInSensor1>\n" +
"                           <CI_ContactCA_RadiometryInSensor1>\n" +
"                               <phoneCA_RadiometryInSensor1>\n" +
"                                   <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                       <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                       <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                   </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                               </phoneCA_RadiometryInSensor1>\n" +
"                               <addressCA_RadiometryInSensor1>\n" +
"                                   <CI_AddressCA_RadiometryInSensor1>\n" +
"                                       <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                       <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                       <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                       <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                       <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                   </CI_AddressCA_RadiometryInSensor1>\n" +
"                               </addressCA_RadiometryInSensor1>\n" +
"                               <onlineResourceCA_RadiometryInSensor1>\n" +
"                                   <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                       <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                       <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                       <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                       <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                   </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                               </onlineResourceCA_RadiometryInSensor1>\n" +
"                               <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                               <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                           </CI_ContactCA_RadiometryInSensor1>\n" +
"                       </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                   </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"               </pointOfContactCA_RadiometryInSensor>\n" +
"           </MD_IdentificationCA_RadiometryInSensor>       \n" +
```

```
"       </sensorSystemIdentification>\n" +
"       <numberSensorHeads>1</numberSensorHeads>\n" +
"       <measurementMethodMTF>definition of the measurement method for the determination of
the modulation transfer function</measurementMethodMTF>\n" +
"       <measurementMethodPSF>definition of the measurement method for the determination of
the point spread function</measurementMethodPSF>\n" +
"   </CA_SensorMeasurement>\n" +
"   <CA_SensorParameters>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
```

```
"                                            </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                        </phoneCA_RadiometryInSensor>\n" +
"                                        <addressCA_RadiometryInSensor>\n" +
"                                            <CI_AddressCA_RadiometryInSensor>\n" +
"                                                <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
```

```
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
```

```
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"       </sensorSystemIdentification>\n" +
"       <numberSensorHeads>1</numberSensorHeads>\n" +
"       <sensorIdentification>\n" +
"           <MD_IdentificationCA_SensorCharacteristics>\n" +
"               <citationCA_SensorCharacteristics>\n" +
"                   <CI_CitationCA_SensorCharacteristics>\n" +
"                       <titleCA_SensorCharacteristics>name by which the cited resource is
known</titleCA_SensorCharacteristics>\n" +
"                       <alternateTitleCA_SensorCharacteristics>short name or other language
name by which the cited information is known</alternateTitleCA_SensorCharacteristics>\n" +
"                       <dateCA_SensorCharacteristics>\n" +
"                           <CI_DateCA_SensorCharacteristics>\n" +
"
<dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA_SensorCharacteristics>\n" +
"
<dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorCharacteristics>\n" +
"                           </CI_DateCA_SensorCharacteristics>\n" +
"                       </dateCA_SensorCharacteristics>\n" +
"                       <editionCA_SensorCharacteristics>version of the cited
resource</editionCA_SensorCharacteristics>\n" +
"                       <editionDateCA_SensorCharacteristics>\n" +
"
<dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDateCA_SensorCharacteristics>\
n" +
"                       </editionDateCA_SensorCharacteristics>\n" +
"                       <identifierCA_SensorCharacteristics>\n" +
"                           <MD_IdentifierCA_SensorCharacteristics>\n" +
"                               <authorityCA_SensorCharacteristics>person or party
responsible for maintenance of the namespace</authorityCA_SensorCharacteristics>\n" +
"                               <codeCA_SensorCharacteristics>alphanumeric value identifying
an instance in the namespace</codeCA_SensorCharacteristics>\n" +
"                           </MD_IdentifierCA_SensorCharacteristics>\n" +
"                       </identifierCA_SensorCharacteristics>\n" +
"                       <citedResponsiblePartyCA_SensorCharacteristics>\n" +
"                           <CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                               <individualNameCA_SensorCharacteristics>name of the
responsible person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics>\n" +
"                               <organisationNameCA_SensorCharacteristics>name of the
responsible organization</organisationNameCA_SensorCharacteristics>\n" +
"                               <positionNameCA_SensorCharacteristics>role or position of
the responsible person</positionNameCA_SensorCharacteristics>\n" +
"                               <contactInfoCA_SensorCharacteristics>\n" +
"                                   <CI_ContactCA_SensorCharacteristics>\n" +
"                                       <phoneCA_SensorCharacteristics>\n" +
"                                           <CI_TelephoneCA_SensorCharacteristics>\n" +
"                                               <voiceCA_SensorCharacteristics>telephone
number by which individuals can speak to the responsible organization or
```

```
individual</voiceCA_SensorCharacteristics>\n" +
"                                                <facsimileCA_SensorCharacteristics>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics>\n" +
"                                            </CI_TelephoneCA_SensorCharacteristics>\n" +
"                                        </phoneCA_SensorCharacteristics>\n" +
"                                        <addressCA_SensorCharacteristics>\n" +
"                                            <CI_AddressCA_SensorCharacteristics>\n" +
"
<deliveryPointCA_SensorCharacteristics>address line for the
location</deliveryPointCA_SensorCharacteristics>\n" +
"                                                <cityCA_SensorCharacteristics>city of the
location</cityCA_SensorCharacteristics>\n" +
"
<administrativeAreaCA_SensorCharacteristics>state, province of the
location</administrativeAreaCA_SensorCharacteristics>\n" +
"                                                <postalCodeCA_SensorCharacteristics>ZIP or
other postal code</postalCodeCA_SensorCharacteristics>\n" +
"                                                <countryCA_SensorCharacteristics>country of
the physical address</countryCA_SensorCharacteristics>\n" +
"
<electronicMailAddressCA_SensorCharacteristics>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics>\n" +
"                                            </CI_AddressCA_SensorCharacteristics>\n" +
"                                        </addressCA_SensorCharacteristics>\n" +
"                                        <onlineResourceCA_SensorCharacteristics>\n" +
"                                            <CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                                <linkageCA_SensorCharacteristics>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics>\n" +
"                                                <protocolCA_SensorCharacteristics>connection
protocol to be used</protocolCA_SensorCharacteristics>\n" +
"
<applicationProfileCA_SensorCharacteristics>name of an application profile that can be used
with the online resource</applicationProfileCA_SensorCharacteristics>\n" +
"
<nameCI_OnlineResourceCA_SensorCharacteristics>name of the online
resource</nameCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<functionCA_SensorCharacteristics>download</functionCA_SensorCharacteristics>\n" +
"                                            </CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                        </onlineResourceCA_SensorCharacteristics>\n" +
"                                        <hoursOfServiceCA_SensorCharacteristics>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics>\n" +
"
<contactInstructionsCA_SensorCharacteristics>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_SensorCharacteristics>\n" +
"                                    </CI_ContactCA_SensorCharacteristics>\n" +
"                                </contactInfoCA_SensorCharacteristics>\n" +
"
<roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorCharacteristics>\n" +
"                            </CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                        </citedResponsiblePartyCA_SensorCharacteristics>\n" +
"
<presentationFormCA_SensorCharacteristics>documentDigital</presentationFormCA_SensorCharacteri
stics>\n" +
"                        <seriesCA_SensorCharacteristics>\n" +
"                            <CI_SeriesCA_SensorCharacteristics>\n" +
"                                <nameCI_SeriesCA_SensorCharacteristics>name of the series,
or aggregate dataset, of which the dataset is a
part</nameCI_SeriesCA_SensorCharacteristics>\n" +
"                                <issueIdentificationCA_SensorCharacteristics>information
```

```
identifying the issue of the series</issueIdentificationCA_SensorCharacteristics>\n" +
"                            <pageCA_SensorCharacteristics>details on which pages of the
publication the article was published</pageCA_SensorCharacteristics>\n" +
"                        </CI_SeriesCA_SensorCharacteristics>\n" +
"                    </seriesCA_SensorCharacteristics>\n" +
"                    <otherCitationDetailsCA_SensorCharacteristics>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_SensorCharacteristics>\n" +
"                    <collectiveTitleCA_SensorCharacteristics>common title with holdings
note</collectiveTitleCA_SensorCharacteristics>\n" +
"                    <ISBNCA_SensorCharacteristics>international Standard Book
Number</ISBNCA_SensorCharacteristics>\n" +
"                    <ISSNCA_SensorCharacteristics>international Standard Serial
Number</ISSNCA_SensorCharacteristics>\n" +
"                </CI_CitationCA_SensorCharacteristics>\n" +
"            </citationCA_SensorCharacteristics>\n" +
"            <abstractCA_SensorCharacteristics>brief narrative summary of the content of
the resource(s)</abstractCA_SensorCharacteristics>\n" +
"            <purposeCA_SensorCharacteristics>summary of the intentions with which the
resource(s) was developed</purposeCA_SensorCharacteristics>\n" +
"            <creditCA_SensorCharacteristics>recognition of those who contributed to the
resource(s)</creditCA_SensorCharacteristics>\n" +
"
<statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>\n" +
"            <pointOfContactCA_SensorCharacteristics>\n" +
"                <CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                    <individualNameCA_SensorCharacteristics1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics1>\n" +
"                    <organisationNameCA_SensorCharacteristics1>name of the responsible
organization</organisationNameCA_SensorCharacteristics1>\n" +
"                    <positionNameCA_SensorCharacteristics1>role or position of the
responsible person</positionNameCA_SensorCharacteristics1>\n" +
"                    <contactInfoCA_SensorCharacteristics1>\n" +
"                        <CI_ContactCA_SensorCharacteristics1>\n" +
"                            <phoneCA_SensorCharacteristics1>\n" +
"                                <CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                    <voiceCA_SensorCharacteristics1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics1>\n" +
"                                    <facsimileCA_SensorCharacteristics1>telephone number
of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics1>\n" +
"                                </CI_TelephoneCA_SensorCharacteristics1>\n" +
"                            </phoneCA_SensorCharacteristics1>\n" +
"                            <addressCA_SensorCharacteristics1>\n" +
"                                <CI_AddressCA_SensorCharacteristics1>\n" +
"                                    <deliveryPointCA_SensorCharacteristics1>address line
for the location</deliveryPointCA_SensorCharacteristics1>\n" +
"                                    <cityCA_SensorCharacteristics1>city of the
location</cityCA_SensorCharacteristics1>\n" +
"                                    <administrativeAreaCA_SensorCharacteristics1>state,
province of the location</administrativeAreaCA_SensorCharacteristics1>\n" +
"                                    <postalCodeCA_SensorCharacteristics1>ZIP or other
postal code</postalCodeCA_SensorCharacteristics1>\n" +
"                                    <countryCA_SensorCharacteristics1>country of the
physical address</countryCA_SensorCharacteristics1>\n" +
"
<electronicMailAddressCA_SensorCharacteristics1>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics1>\n" +
"                            </CI_AddressCA_SensorCharacteristics1>\n" +
"                        </addressCA_SensorCharacteristics1>\n" +
"                        <onlineResourceCA_SensorCharacteristics1>\n" +
"                            <CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                <linkageCA_SensorCharacteristics1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
```

```
scheme</linkageCA_SensorCharacteristics1>\n" +
"                                        <protocolCA_SensorCharacteristics1>connection
protocol to be used</protocolCA_SensorCharacteristics1>\n" +
"                                        <applicationProfileCA_SensorCharacteristics1>name of
an application profile that can be used with the online
resource</applicationProfileCA_SensorCharacteristics1>\n" +
"                                        <nameCI_OnlineResourceCA_SensorCharacteristics1>name
of the online resource</nameCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<functionCA_SensorCharacteristics1>download</functionCA_SensorCharacteristics1>\n" +
"                                    </CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                </onlineResourceCA_SensorCharacteristics1>\n" +
"                                <hoursOfServiceCA_SensorCharacteristics1>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics1>\n" +
"                                <contactInstructionsCA_SensorCharacteristics1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_SensorCharacteristics1>\n" +
"                            </CI_ContactCA_SensorCharacteristics1>\n" +
"                        </contactInfoCA_SensorCharacteristics1>\n" +
"
<roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacteristics1>\n" +
"                    </CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                </pointOfContactCA_SensorCharacteristics>\n" +
"            </MD_IdentificationCA_SensorCharacteristics>        \n" +
"       </sensorIdentification>\n" +
"       <cameraHead>camera or sensor head for which the information is valid</cameraHead>\n" +
"       <channel>channel for which the information is valid</channel>\n" +
"       <pointSpreadFunction>\n" +
"           <CA_PointSpreadFunctionCA_SensorParameters>\n" +
"
<shapeCA_PointSpreadFunctionCA_SensorParameters>square</shapeCA_PointSpreadFunctionCA_SensorPa
rameters>\n" +
"               <spreadingCA_SensorParameters>characteristic parameters or as a discrete
function</spreadingCA_SensorParameters>\n" +
"           </CA_PointSpreadFunctionCA_SensorParameters>\n" +
"       </pointSpreadFunction>\n" +
"       <fNumberDenominator>1</fNumberDenominator>\n" +
"       <samplingPattern>square</samplingPattern>\n" +
"       <spectralResponse>\n" +
"           <CA_SpectrumCA_SensorParameters>\n" +
"               <numberBandsCA_SensorParameters>0</numberBandsCA_SensorParameters>\n" +
"               <wavelengthCA_SpectrumCA_SensorParameters
uom=\"#m\">0.0</wavelengthCA_SpectrumCA_SensorParameters>\n" +
"               <responseCA_SensorParameters>0.0</responseCA_SensorParameters>\n" +
"           </CA_SpectrumCA_SensorParameters>\n" +
"       </spectralResponse>\n" +
"   </CA_SensorParameters>\n" +
"   <CA_SensorPostProcessing>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
```

```
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                           </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                       </phoneCA_RadiometryInSensor>\n" +
"                                       <addressCA_RadiometryInSensor>\n" +
"                                           <CI_AddressCA_RadiometryInSensor>\n" +
"                                               <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
"                                               <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                               <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                               <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                           </CI_AddressCA_RadiometryInSensor>\n" +
"                                       </addressCA_RadiometryInSensor>\n" +
"                                       <onlineResourceCA_RadiometryInSensor>\n" +
"                                           <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                               <linkageCA_RadiometryInSensor>location
```

```
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
```

```
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"        <colourTransformation>coefficients that are used to perform a colour
transformation</colourTransformation>\n" +
```

```
"   </CA_SensorPostProcessing>\n" +
"   <CA_SensorQualityEvaluation>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <case>1</case>\n" +
"       <numberOfPieces>0</numberOfPieces>\n" +
"       <gain>0.0</gain>\n" +
"       <offset>0.0</offset>\n" +
"       <signOfGain>1</signOfGain>\n" +
"       <minWavelength>0.0</minWavelength>\n" +
"       <maxWavelength>0.0</maxWavelength>\n" +
"       <b>0.0</b>\n" +
"       <c>0.0</c>\n" +
"       <sensorSystemIdentification>\n" +
"           <MD_IdentificationCA_RadiometryInSensor>\n" +
"               <citationCA_RadiometryInSensor>\n" +
"                   <CI_CitationCA_RadiometryInSensor>\n" +
"                       <titleCA_RadiometryInSensor>name by which the cited resource is
known</titleCA_RadiometryInSensor>\n" +
"                       <alternateTitleCA_RadiometryInSensor>short name or other language
name by which the cited information is known</alternateTitleCA_RadiometryInSensor>\n" +
"                       <dateCA_RadiometryInSensor>\n" +
"                           <CI_DateCA_RadiometryInSensor>\n" +
"
<dateCI_DateCA_RadiometryInSensor>01-09-2015</dateCI_DateCA_RadiometryInSensor>\n" +
"
<dateTypeCA_RadiometryInSensor>creation</dateTypeCA_RadiometryInSensor>\n" +
"                           </CI_DateCA_RadiometryInSensor>\n" +
"                       </dateCA_RadiometryInSensor>\n" +
"                       <editionCA_RadiometryInSensor>version of the cited
resource</editionCA_RadiometryInSensor>\n" +
"                       <editionDateCA_RadiometryInSensor>\n" +
"
<dateEditionDateCA_RadiometryInSensor>01-09-2015</dateEditionDateCA_RadiometryInSensor>\n" +
"                       </editionDateCA_RadiometryInSensor>\n" +
"                       <identifierCA_RadiometryInSensor>\n" +
"                           <MD_IdentifierCA_RadiometryInSensor>\n" +
"                               <authorityCA_RadiometryInSensor>person or party responsible
for maintenance of the namespace</authorityCA_RadiometryInSensor>\n" +
"                               <codeCA_RadiometryInSensor>alphanumeric value identifying an
instance in the namespace</codeCA_RadiometryInSensor>\n" +
"                           </MD_IdentifierCA_RadiometryInSensor>\n" +
"                       </identifierCA_RadiometryInSensor>\n" +
"                       <citedResponsiblePartyCA_RadiometryInSensor>\n" +
"                           <CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                               <individualNameCA_RadiometryInSensor>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor>\n" +
"                               <organisationNameCA_RadiometryInSensor>name of the
responsible organization</organisationNameCA_RadiometryInSensor>\n" +
"                               <positionNameCA_RadiometryInSensor>role or position of the
responsible person</positionNameCA_RadiometryInSensor>\n" +
"                               <contactInfoCA_RadiometryInSensor>\n" +
"                                   <CI_ContactCA_RadiometryInSensor>\n" +
"                                       <phoneCA_RadiometryInSensor>\n" +
"                                           <CI_TelephoneCA_RadiometryInSensor>\n" +
"                                               <voiceCA_RadiometryInSensor>telephone number
by which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor>\n" +
"                                               <facsimileCA_RadiometryInSensor>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor>\n" +
"                                           </CI_TelephoneCA_RadiometryInSensor>\n" +
"                                       </phoneCA_RadiometryInSensor>\n" +
"                                       <addressCA_RadiometryInSensor>\n" +
"                                           <CI_AddressCA_RadiometryInSensor>\n" +
"                                               <deliveryPointCA_RadiometryInSensor>address
line for the location</deliveryPointCA_RadiometryInSensor>\n" +
```

```
"                                                <cityCA_RadiometryInSensor>city of the
location</cityCA_RadiometryInSensor>\n" +
"
<administrativeAreaCA_RadiometryInSensor>state, province of the
location</administrativeAreaCA_RadiometryInSensor>\n" +
"                                                <postalCodeCA_RadiometryInSensor>ZIP or
other postal code</postalCodeCA_RadiometryInSensor>\n" +
"                                                <countryCA_RadiometryInSensor>country of the
physical address</countryCA_RadiometryInSensor>\n" +
"
<electronicMailAddressCA_RadiometryInSensor>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor>\n" +
"                                            </CI_AddressCA_RadiometryInSensor>\n" +
"                                        </addressCA_RadiometryInSensor>\n" +
"                                        <onlineResourceCA_RadiometryInSensor>\n" +
"                                            <CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                                <linkageCA_RadiometryInSensor>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor>\n" +
"                                                <protocolCA_RadiometryInSensor>connection
protocol to be used</protocolCA_RadiometryInSensor>\n" +
"
<applicationProfileCA_RadiometryInSensor>name of an application profile that can be used
with the online resource</applicationProfileCA_RadiometryInSensor>\n" +
"
<nameCI_OnlineResourceCA_RadiometryInSensor>name of the online
resource</nameCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor>\n" +
"
<functionCA_RadiometryInSensor>download</functionCA_RadiometryInSensor>\n" +
"                                            </CI_OnlineResourceCA_RadiometryInSensor>\n" +
"                                        </onlineResourceCA_RadiometryInSensor>\n" +
"                                        <hoursOfServiceCA_RadiometryInSensor>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor>\n" +
"
<contactInstructionsCA_RadiometryInSensor>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_RadiometryInSensor>\n" +
"                                    </CI_ContactCA_RadiometryInSensor>\n" +
"                                </contactInfoCA_RadiometryInSensor>\n" +
"
<roleCA_RadiometryInSensor>resourceProvider</roleCA_RadiometryInSensor>\n" +
"                            </CI_ResponsiblePartyCA_RadiometryInSensor>\n" +
"                        </citedResponsiblePartyCA_RadiometryInSensor>\n" +
"
<presentationFormCA_RadiometryInSensor>documentDigital</presentationFormCA_RadiometryInSensor>
\n" +
"                        <seriesCA_RadiometryInSensor>\n" +
"                            <CI_SeriesCA_RadiometryInSensor>\n" +
"                                <nameCI_SeriesCA_RadiometryInSensor>name of the series, or
aggregate dataset, of which the dataset is a part</nameCI_SeriesCA_RadiometryInSensor>\n" +
"                                <issueIdentificationCA_RadiometryInSensor>information
identifying the issue of the series</issueIdentificationCA_RadiometryInSensor>\n" +
"                                <pageCA_RadiometryInSensor>details on which pages of the
publication the article was published</pageCA_RadiometryInSensor>\n" +
"                            </CI_SeriesCA_RadiometryInSensor>\n" +
"                        </seriesCA_RadiometryInSensor>\n" +
"                        <otherCitationDetailsCA_RadiometryInSensor>other information
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_RadiometryInSensor>\n" +
"                        <collectiveTitleCA_RadiometryInSensor>common title with holdings
note</collectiveTitleCA_RadiometryInSensor>\n" +
"                        <ISBNCA_RadiometryInSensor>international Standard Book
Number</ISBNCA_RadiometryInSensor>\n" +
"                        <ISSNCA_RadiometryInSensor>international Standard Serial
```

```
Number</ISSNCA_RadiometryInSensor>\n" +
"                    </CI_CitationCA_RadiometryInSensor>\n" +
"                </citationCA_RadiometryInSensor>\n" +
"                <abstractCA_RadiometryInSensor>brief narrative summary of the content of the
resource(s)</abstractCA_RadiometryInSensor>\n" +
"                <purposeCA_RadiometryInSensor>summary of the intentions with which the
resource(s) was developed</purposeCA_RadiometryInSensor>\n" +
"                <creditCA_RadiometryInSensor>recognition of those who contributed to the
resource(s)</creditCA_RadiometryInSensor>\n" +
"                <statusCA_RadiometryInSensor>completed</statusCA_RadiometryInSensor>\n" +
"                <pointOfContactCA_RadiometryInSensor>\n" +
"                    <CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                        <individualNameCA_RadiometryInSensor1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_RadiometryInSensor1>\n" +
"                        <organisationNameCA_RadiometryInSensor1>name of the responsible
organization</organisationNameCA_RadiometryInSensor1>\n" +
"                        <positionNameCA_RadiometryInSensor1>role or position of the
responsible person</positionNameCA_RadiometryInSensor1>\n" +
"                        <contactInfoCA_RadiometryInSensor1>\n" +
"                            <CI_ContactCA_RadiometryInSensor1>\n" +
"                                <phoneCA_RadiometryInSensor1>\n" +
"                                    <CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                        <voiceCA_RadiometryInSensor1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_RadiometryInSensor1>\n" +
"                                        <facsimileCA_RadiometryInSensor1>telephone number of
a facsimile machine for the responsible organization or
individual</facsimileCA_RadiometryInSensor1>\n" +
"                                    </CI_TelephoneCA_RadiometryInSensor1>\n" +
"                                </phoneCA_RadiometryInSensor1>\n" +
"                                <addressCA_RadiometryInSensor1>\n" +
"                                    <CI_AddressCA_RadiometryInSensor1>\n" +
"                                        <deliveryPointCA_RadiometryInSensor1>address line
for the location</deliveryPointCA_RadiometryInSensor1>\n" +
"                                        <cityCA_RadiometryInSensor1>city of the
location</cityCA_RadiometryInSensor1>\n" +
"                                        <administrativeAreaCA_RadiometryInSensor1>state,
province of the location</administrativeAreaCA_RadiometryInSensor1>\n" +
"                                        <postalCodeCA_RadiometryInSensor1>ZIP or other
postal code</postalCodeCA_RadiometryInSensor1>\n" +
"                                        <countryCA_RadiometryInSensor1>country of the
physical address</countryCA_RadiometryInSensor1>\n" +
"
<electronicMailAddressCA_RadiometryInSensor1>telephone number of a facsimile machine for the
responsible organization or individual</electronicMailAddressCA_RadiometryInSensor1>\n" +
"                                    </CI_AddressCA_RadiometryInSensor1>\n" +
"                                </addressCA_RadiometryInSensor1>\n" +
"                                <onlineResourceCA_RadiometryInSensor1>\n" +
"                                    <CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                        <linkageCA_RadiometryInSensor1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_RadiometryInSensor1>\n" +
"                                        <protocolCA_RadiometryInSensor1>connection protocol
to be used</protocolCA_RadiometryInSensor1>\n" +
"                                        <applicationProfileCA_RadiometryInSensor1>name of an
application profile that can be used with the online
resource</applicationProfileCA_RadiometryInSensor1>\n" +
"                                        <nameCI_OnlineResourceCA_RadiometryInSensor1>name of
the online resource</nameCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<descriptionCI_OnlineResourceCA_RadiometryInSensor1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_RadiometryInSensor1>\n" +
"
<functionCA_RadiometryInSensor1>download</functionCA_RadiometryInSensor1>\n" +
"                                    </CI_OnlineResourceCA_RadiometryInSensor1>\n" +
"                                </onlineResourceCA_RadiometryInSensor1>\n" +
```

```
"                                <hoursOfServiceCA_RadiometryInSensor1>time period (including
time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_RadiometryInSensor1>\n" +
"                                <contactInstructionsCA_RadiometryInSensor1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_RadiometryInSensor1>\n" +
"                            </CI_ContactCA_RadiometryInSensor1>\n" +
"                        </contactInfoCA_RadiometryInSensor1>\n" +
"
<roleCA_RadiometryInSensor1>resourceProvider</roleCA_RadiometryInSensor1>\n" +
"                    </CI_ResponsiblePartyCA_RadiometryInSensor1>\n" +
"                </pointOfContactCA_RadiometryInSensor>\n" +
"            </MD_IdentificationCA_RadiometryInSensor>       \n" +
"        </sensorSystemIdentification>\n" +
"        <numberSensorHeads>1</numberSensorHeads>\n" +
"        <sensorIdentification>\n" +
"            <MD_IdentificationCA_SensorCharacteristics>\n" +
"                <citationCA_SensorCharacteristics>\n" +
"                    <CI_CitationCA_SensorCharacteristics>\n" +
"                        <titleCA_SensorCharacteristics>name by which the cited resource is
known</titleCA_SensorCharacteristics>\n" +
"                        <alternateTitleCA_SensorCharacteristics>short name or other language
name by which the cited information is known</alternateTitleCA_SensorCharacteristics>\n" +
"                        <dateCA_SensorCharacteristics>\n" +
"                            <CI_DateCA_SensorCharacteristics>\n" +
"
<dateCI_DateCA_SensorCharacteristics>01-09-2015</dateCI_DateCA_SensorCharacteristics>\n" +
"
<dateTypeCA_SensorCharacteristics>creation</dateTypeCA_SensorCharacteristics>\n" +
"                            </CI_DateCA_SensorCharacteristics>\n" +
"                        </dateCA_SensorCharacteristics>\n" +
"                        <editionCA_SensorCharacteristics>version of the cited
resource</editionCA_SensorCharacteristics>\n" +
"                        <editionDateCA_SensorCharacteristics>\n" +
"
<dateEditionDateCA_SensorCharacteristics>01-09-2015</dateEditionDateCA_SensorCharacteristics>\
n" +
"                        </editionDateCA_SensorCharacteristics>\n" +
"                        <identifierCA_SensorCharacteristics>\n" +
"                            <MD_IdentifierCA_SensorCharacteristics>\n" +
"                                <authorityCA_SensorCharacteristics>person or party
responsible for maintenance of the namespace</authorityCA_SensorCharacteristics>\n" +
"                                <codeCA_SensorCharacteristics>alphanumeric value identifying
an instance in the namespace</codeCA_SensorCharacteristics>\n" +
"                            </MD_IdentifierCA_SensorCharacteristics>\n" +
"                        </identifierCA_SensorCharacteristics>\n" +
"                        <citedResponsiblePartyCA_SensorCharacteristics>\n" +
"                            <CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                                <individualNameCA_SensorCharacteristics>name of the
responsible person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics>\n" +
"                                <organisationNameCA_SensorCharacteristics>name of the
responsible organization</organisationNameCA_SensorCharacteristics>\n" +
"                                <positionNameCA_SensorCharacteristics>role or position of
the responsible person</positionNameCA_SensorCharacteristics>\n" +
"                                <contactInfoCA_SensorCharacteristics>\n" +
"                                    <CI_ContactCA_SensorCharacteristics>\n" +
"                                        <phoneCA_SensorCharacteristics>\n" +
"                                            <CI_TelephoneCA_SensorCharacteristics>\n" +
"                                                <voiceCA_SensorCharacteristics>telephone
number by which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics>\n" +
"                                                <facsimileCA_SensorCharacteristics>telephone
number of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics>\n" +
"                                            </CI_TelephoneCA_SensorCharacteristics>\n" +
"                                        </phoneCA_SensorCharacteristics>\n" +
```

```
"                                        <addressCA_SensorCharacteristics>\n" +
"                                            <CI_AddressCA_SensorCharacteristics>\n" +
"
<deliveryPointCA_SensorCharacteristics>address line for the
location</deliveryPointCA_SensorCharacteristics>\n" +
"                                                <cityCA_SensorCharacteristics>city of the
location</cityCA_SensorCharacteristics>\n" +
"
<administrativeAreaCA_SensorCharacteristics>state, province of the
location</administrativeAreaCA_SensorCharacteristics>\n" +
"                                                <postalCodeCA_SensorCharacteristics>ZIP or
other postal code</postalCodeCA_SensorCharacteristics>\n" +
"                                                <countryCA_SensorCharacteristics>country of
the physical address</countryCA_SensorCharacteristics>\n" +
"
<electronicMailAddressCA_SensorCharacteristics>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics>\n" +
"                                            </CI_AddressCA_SensorCharacteristics>\n" +
"                                        </addressCA_SensorCharacteristics>\n" +
"                                        <onlineResourceCA_SensorCharacteristics>\n" +
"                                            <CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                                <linkageCA_SensorCharacteristics>location
(address) for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics>\n" +
"                                                <protocolCA_SensorCharacteristics>connection
protocol to be used</protocolCA_SensorCharacteristics>\n" +
"
<applicationProfileCA_SensorCharacteristics>name of an application profile that can be used
with the online resource</applicationProfileCA_SensorCharacteristics>\n" +
"
<nameCI_OnlineResourceCA_SensorCharacteristics>name of the online
resource</nameCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics>\n" +
"
<functionCA_SensorCharacteristics>download</functionCA_SensorCharacteristics>\n" +
"                                            </CI_OnlineResourceCA_SensorCharacteristics>\n" +
"                                        </onlineResourceCA_SensorCharacteristics>\n" +
"                                        <hoursOfServiceCA_SensorCharacteristics>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics>\n" +
"
<contactInstructionsCA_SensorCharacteristics>supplemental instructions on how or when to
contact the individual or organization</contactInstructionsCA_SensorCharacteristics>\n" +
"                                    </CI_ContactCA_SensorCharacteristics>\n" +
"                                </contactInfoCA_SensorCharacteristics>\n" +
"
<roleCA_SensorCharacteristics>resourceProvider</roleCA_SensorCharacteristics>\n" +
"                            </CI_ResponsiblePartyCA_SensorCharacteristics>\n" +
"                        </citedResponsiblePartyCA_SensorCharacteristics>\n" +
"
<presentationFormCA_SensorCharacteristics>documentDigital</presentationFormCA_SensorCharacteri
stics>\n" +
"                        <seriesCA_SensorCharacteristics>\n" +
"                            <CI_SeriesCA_SensorCharacteristics>\n" +
"                                <nameCI_SeriesCA_SensorCharacteristics>name of the series,
or aggregate dataset, of which the dataset is a
part</nameCI_SeriesCA_SensorCharacteristics>\n" +
"                                <issueIdentificationCA_SensorCharacteristics>information
identifying the issue of the series</issueIdentificationCA_SensorCharacteristics>\n" +
"                                <pageCA_SensorCharacteristics>details on which pages of the
publication the article was published</pageCA_SensorCharacteristics>\n" +
"                            </CI_SeriesCA_SensorCharacteristics>\n" +
"                        </seriesCA_SensorCharacteristics>\n" +
"                        <otherCitationDetailsCA_SensorCharacteristics>other information
```

```
required to complete the citation that is not recorded
elsewhere</otherCitationDetailsCA_SensorCharacteristics>\n" +
"                        <collectiveTitleCA_SensorCharacteristics>common title with holdings
note</collectiveTitleCA_SensorCharacteristics>\n" +
"                        <ISBNCA_SensorCharacteristics>international Standard Book
Number</ISBNCA_SensorCharacteristics>\n" +
"                        <ISSNCA_SensorCharacteristics>international Standard Serial
Number</ISSNCA_SensorCharacteristics>\n" +
"                    </CI_CitationCA_SensorCharacteristics>\n" +
"                </citationCA_SensorCharacteristics>\n" +
"                <abstractCA_SensorCharacteristics>brief narrative summary of the content of
the resource(s)</abstractCA_SensorCharacteristics>\n" +
"                <purposeCA_SensorCharacteristics>summary of the intentions with which the
resource(s) was developed</purposeCA_SensorCharacteristics>\n" +
"                <creditCA_SensorCharacteristics>recognition of those who contributed to the
resource(s)</creditCA_SensorCharacteristics>\n" +
"
<statusCA_SensorCharacteristics>completed</statusCA_SensorCharacteristics>\n" +
"                <pointOfContactCA_SensorCharacteristics>\n" +
"                    <CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                        <individualNameCA_SensorCharacteristics1>name of the responsible
person- surname,given name, title separated by a
delimiter</individualNameCA_SensorCharacteristics1>\n" +
"                        <organisationNameCA_SensorCharacteristics1>name of the responsible
organization</organisationNameCA_SensorCharacteristics1>\n" +
"                        <positionNameCA_SensorCharacteristics1>role or position of the
responsible person</positionNameCA_SensorCharacteristics1>\n" +
"                        <contactInfoCA_SensorCharacteristics1>\n" +
"                            <CI_ContactCA_SensorCharacteristics1>\n" +
"                                <phoneCA_SensorCharacteristics1>\n" +
"                                    <CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                        <voiceCA_SensorCharacteristics1>telephone number by
which individuals can speak to the responsible organization or
individual</voiceCA_SensorCharacteristics1>\n" +
"                                        <facsimileCA_SensorCharacteristics1>telephone number
of a facsimile machine for the responsible organization or
individual</facsimileCA_SensorCharacteristics1>\n" +
"                                    </CI_TelephoneCA_SensorCharacteristics1>\n" +
"                                </phoneCA_SensorCharacteristics1>\n" +
"                                <addressCA_SensorCharacteristics1>\n" +
"                                    <CI_AddressCA_SensorCharacteristics1>\n" +
"                                        <deliveryPointCA_SensorCharacteristics1>address line
for the location</deliveryPointCA_SensorCharacteristics1>\n" +
"                                        <cityCA_SensorCharacteristics1>city of the
location</cityCA_SensorCharacteristics1>\n" +
"                                        <administrativeAreaCA_SensorCharacteristics1>state,
province of the location</administrativeAreaCA_SensorCharacteristics1>\n" +
"                                        <postalCodeCA_SensorCharacteristics1>ZIP or other
postal code</postalCodeCA_SensorCharacteristics1>\n" +
"                                        <countryCA_SensorCharacteristics1>country of the
physical address</countryCA_SensorCharacteristics1>\n" +
"
<electronicMailAddressCA_SensorCharacteristics1>telephone number of a facsimile machine for
the responsible organization or
individual</electronicMailAddressCA_SensorCharacteristics1>\n" +
"                                    </CI_AddressCA_SensorCharacteristics1>\n" +
"                                </addressCA_SensorCharacteristics1>\n" +
"                                <onlineResourceCA_SensorCharacteristics1>\n" +
"                                    <CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                        <linkageCA_SensorCharacteristics1>location (address)
for on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageCA_SensorCharacteristics1>\n" +
"                                        <protocolCA_SensorCharacteristics1>connection
protocol to be used</protocolCA_SensorCharacteristics1>\n" +
"                                        <applicationProfileCA_SensorCharacteristics1>name of
an application profile that can be used with the online
resource</applicationProfileCA_SensorCharacteristics1>\n" +
```

```
"                                        <nameCI_OnlineResourceCA_SensorCharacteristics1>name
of the online resource</nameCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<descriptionCI_OnlineResourceCA_SensorCharacteristics1>detailed text description of what the
online resource is/does</descriptionCI_OnlineResourceCA_SensorCharacteristics1>\n" +
"
<functionCA_SensorCharacteristics1>download</functionCA_SensorCharacteristics1>\n" +
"                                    </CI_OnlineResourceCA_SensorCharacteristics1>\n" +
"                                </onlineResourceCA_SensorCharacteristics1>\n" +
"                                <hoursOfServiceCA_SensorCharacteristics1>time period
(including time zone) when individuals can contact the organization or
individual</hoursOfServiceCA_SensorCharacteristics1>\n" +
"                                <contactInstructionsCA_SensorCharacteristics1>supplemental
instructions on how or when to contact the individual or
organization</contactInstructionsCA_SensorCharacteristics1>\n" +
"                            </CI_ContactCA_SensorCharacteristics1>\n" +
"                        </contactInfoCA_SensorCharacteristics1>\n" +
"
<roleCA_SensorCharacteristics1>resourceProvider</roleCA_SensorCharacteristics1>\n" +
"                    </CI_ResponsiblePartyCA_SensorCharacteristics1>\n" +
"                </pointOfContactCA_SensorCharacteristics>\n" +
"            </MD_IdentificationCA_SensorCharacteristics>        \n" +
"       </sensorIdentification>\n" +
"       <cameraHead>camera or sensor head for which the information is valid</cameraHead>\n" +
"       <channel>channel for which the information is valid</channel>\n" +
"       <linearity>\n" +
"           <CA_Linearity>\n" +
"               <channelIdentification>alpha-numerical identification for the
channel</channelIdentification>\n" +
"               <receivedIntensity>0.0</receivedIntensity>\n" +
"               <recordedIntensity>0.0</recordedIntensity>\n" +
"           </CA_Linearity>\n" +
"       </linearity>\n" +
"       <absoluteSpectralError>0</absoluteSpectralError>\n" +
"       <relativeSpectralError>0.0</relativeSpectralError>\n" +
"       <dynamicRange>\n" +
"           <CA_DynamicRange>\n" +
"               <minimumGreyValue>0.0</minimumGreyValue>\n" +
"               <maximumGreyValue>0.0</maximumGreyValue>\n" +
"           </CA_DynamicRange>\n" +
"       </dynamicRange>\n" +
"       <spectralSensitivity>\n" +
"           <CA_SpectralSensitivity>\n" +
"               <minimumWavelength uom=\"#m\">0.0</minimumWavelength>\n" +
"               <maximumWavelength uom=\"#m\">0.0</maximumWavelength>\n" +
"               <sensitivityFunction>function that relates the received radiation to the
sensorx92s response</sensitivityFunction>\n" +
"           </CA_SpectralSensitivity>\n" +
"       </spectralSensitivity>\n" +
"       <signalToNoiseRatio>\n" +
"           <CA_RadiometricDynamicsSignalToNoiseRatio>\n" +
"               <bitSignalToNoiseRatio>1</bitSignalToNoiseRatio>\n" +
"           </CA_RadiometricDynamicsSignalToNoiseRatio>\n" +
"       </signalToNoiseRatio>\n" +
"       <illuminationLevel>0.0</illuminationLevel>\n" +
"       <modulationTransferFunction>0.0</modulationTransferFunction>\n" +
"       <modulationTransferFunctionAcross>0.0</modulationTransferFunctionAcross>\n" +
"       <modulationTransferFunctionAlong>0.0</modulationTransferFunctionAlong>\n" +
"       <positionInImage>1.0</positionInImage>\n" +
"       <polarization>definition of the polarization characteristics of the
sensor</polarization>\n" +
"       <radiomatricDynamics>\n" +
"           <CA_RadiometricDynamicsRadiomatricDynamics>\n" +
"               <bitRadiomatricDynamics>1</bitRadiomatricDynamics>\n" +
"           </CA_RadiometricDynamicsRadiomatricDynamics>\n" +
"       </radiomatricDynamics>\n" +
"       <antiBlooming>yes</antiBlooming>\n" +
```

```
"   </CA_SensorQualityEvaluation>\n" +
"   <CA_SensorSystem>\n" +
"       <calibrationType>laboratory</calibrationType>\n" +
"       <geometryCalibrationDate>1-09-2015 12:00:00</geometryCalibrationDate>\n" +
"       <geometryCalibrationType>more detailed explanation of the the calibration
type</geometryCalibrationType>\n" +
"       <synchronizationCA_SensorSystem>0-0-0 00:00:00</synchronizationCA_SensorSystem>\n" +
"       <synchronizationErrorCA_SensorSystem>0-0-0
00:00:00</synchronizationErrorCA_SensorSystem>\n" +
"       <referenceTemperatureCA_SensorSystem>\n" +
"           <CA_TemperatureCA_SensorSystem>\n" +
"               <temperatureCA_SensorSystem>0.0</temperatureCA_SensorSystem>\n" +
"           </CA_TemperatureCA_SensorSystem>\n" +
"       </referenceTemperatureCA_SensorSystem>\n" +
"       <versionFirmwareCA_SensorSystem>note about the firmware
version</versionFirmwareCA_SensorSystem>\n" +
"       <versionHardwareCA_SensorSystem>note about the hardware
version</versionHardwareCA_SensorSystem>\n" +
"       <relativePosition>0.0</relativePosition>\n" +
"       <relativeAttitude>\n" +
"           <SD_AttitudeCA_SensorSystem>\n" +
"               <angleAttitudeCA_SensorSystem>\n" +
"                   <SD_AngleAttitudeCA_SensorSystem>\n" +
"                       <rotatedAxesCA_SensorSystem>yes</rotatedAxesCA_SensorSystem>\n" +
"                       <rotationAngleXCA_SensorSystem
uom=\"#m\">0.0</rotationAngleXCA_SensorSystem>\n" +
"                       <rotationAngleYCA_SensorSystem
uom=\"#m\">0.0</rotationAngleYCA_SensorSystem>\n" +
"                       <rotationAngleZCA_SensorSystem
uom=\"#m\">0.0</rotationAngleZCA_SensorSystem>\n" +
"
<rotationSequenceCA_SensorSystem>XYZ</rotationSequenceCA_SensorSystem>\n" +
"                   </SD_AngleAttitudeCA_SensorSystem>\n" +
"               </angleAttitudeCA_SensorSystem>\n" +
"               <matrixAttitudeCA_SensorSystem>\n" +
"                   <SD_MatrixAttitudeCA_SensorSystem>\n" +
"
<matrixElements1CA_SensorSystem>0.0</matrixElements1CA_SensorSystem>\n" +
"
<matrixElements2CA_SensorSystem>0.0</matrixElements2CA_SensorSystem>\n" +
"
<matrixElements3CA_SensorSystem>0.0</matrixElements3CA_SensorSystem>\n" +
"
<matrixElements4CA_SensorSystem>0.0</matrixElements4CA_SensorSystem>\n" +
"
<matrixElements5CA_SensorSystem>0.0</matrixElements5CA_SensorSystem>\n" +
"
<matrixElements6CA_SensorSystem>0.0</matrixElements6CA_SensorSystem>\n" +
"
<matrixElements7CA_SensorSystem>0.0</matrixElements7CA_SensorSystem>\n" +
"
<matrixElements8CA_SensorSystem>0.0</matrixElements8CA_SensorSystem>\n" +
"
<matrixElements9CA_SensorSystem>0.0</matrixElements9CA_SensorSystem>\n" +
"                   </SD_MatrixAttitudeCA_SensorSystem>\n" +
"               </matrixAttitudeCA_SensorSystem>\n" +
"           </SD_AttitudeCA_SensorSystem>       \n" +
"       </relativeAttitude>\n" +
"       <stitchingResiduals uom=\"#m\">0.0</stitchingResiduals>\n" +
"       <operationalTemperature>\n" +
"           <CA_TemperatureRangeCA_SensorSystem>\n" +
"               <minimumTemperatureCA_SensorSystem1>\n" +
"                   <CA_TemperatureCA_SensorSystem1>\n" +
"                       <temperatureCA_SensorSystem1>0.0</temperatureCA_SensorSystem1>\n" +
"                   </CA_TemperatureCA_SensorSystem1>\n" +
"               </minimumTemperatureCA_SensorSystem1>\n" +
"               <maximumTemperatureCA_SensorSystem2>\n" +
```

```
"                    <CA_TemperatureCA_SensorSystem2>\n" +
"                        <temperatureCA_SensorSystem2>0.0</temperatureCA_SensorSystem2>\n" +
"                    </CA_TemperatureCA_SensorSystem2>\n" +
"                </maximumTemperatureCA_SensorSystem2>\n" +
"            </CA_TemperatureRangeCA_SensorSystem>\n" +
"        </operationalTemperature>\n" +
"    </CA_SensorSystem>\n" +
"    <CA_Siemensstar>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <sizeCA_Siemensstar uom=\"#m\">0.0</sizeCA_Siemensstar>\n" +
"        <descriptionCA_Siemensstar>free text description of the
target</descriptionCA_Siemensstar>\n" +
"        <typeCA_Siemensstar>airforcePattern</typeCA_Siemensstar>\n" +
"        <materialCA_Siemensstar>awning</materialCA_Siemensstar>\n" +
"        <paintTypeCA_Siemensstar>characteristics of the paint</paintTypeCA_Siemensstar>\n" +
"        <reflectancePropertiesCA_Siemensstar>peculiarity of the
reflectance</reflectancePropertiesCA_Siemensstar>\n" +
"        <diameter uom=\"#m\">0.0</diameter>\n" +
"        <sector uom=\"#m\">0.0</sector>\n" +
"        <numberOfBarsInSector>1</numberOfBarsInSector>\n" +
"    </CA_Siemensstar>\n" +
"    <CA_SMACParameters>\n" +
"        <k>0.0</k>\n" +
"        <p1>0.0</p1>\n" +
"        <p2>0.0</p2>\n" +
"    </CA_SMACParameters>\n" +
"    <CA_SpectralSensitivity>\n" +
"        <minimumWavelength uom=\"#m\">0.0</minimumWavelength>\n" +
"        <maximumWavelength uom=\"#m\">0.0</maximumWavelength>\n" +
"        <sensitivityFunction>function that relates the received radiation to the sensorx92s
response</sensitivityFunction>\n" +
"    </CA_SpectralSensitivity>\n" +
"    <CA_Spectrum>\n" +
"        <numberBands>0</numberBands>\n" +
"        <wavelengthCA_Spectrum uom=\"#m\">0.0</wavelengthCA_Spectrum>\n" +
"        <response>0.0</response>\n" +
"    </CA_Spectrum>\n" +
"    <CA_TangentialDistortion>\n" +
"        <t1>0.0</t1>\n" +
"        <t2>0.0</t2>\n" +
"    </CA_TangentialDistortion>\n" +
"    <CA_Target>\n" +
"        <equipment>description of additional equipment</equipment>\n" +
"        <targetInclination uom=\"#m\">0.0</targetInclination>\n" +
"        <targetAzimuth uom=\"#m\">0.0</targetAzimuth>\n" +
"        <targetAltitude uom=\"#m\">0.0</targetAltitude>\n" +
"        <skyViewFactor>0.0</skyViewFactor>\n" +
"        <viewshed>area that is visible from a fixed vantage point</viewshed>\n" +
"        <targetEnvironment>homogeneous</targetEnvironment>\n" +
"        <targetAccessibility>accessibility of the target primarily regarding road condition
and eventual seasonal changes</targetAccessibility>\n" +
"        <targetStability>description of the mechanical stability of the
target</targetStability>\n" +
"        <transmittanceSunToTarget>0.0</transmittanceSunToTarget>\n" +
"        <transmittanceTargetToSatellite>0.0</transmittanceTargetToSatellite>\n" +
"        <sunRadiationAtTopOfAtmosphere>0.0</sunRadiationAtTopOfAtmosphere>\n" +
"        <radianceAtSatellite>0.0</radianceAtSatellite>\n" +
"    </CA_Target>\n" +
"    <CA_Temperature>\n" +
"        <temperature>0.0</temperature>\n" +
"    </CA_Temperature>\n" +
"    <CA_TemperatureRange>\n" +
"        <minimumTemperature>\n" +
"            <CA_TemperatureMinimumTemperature>\n" +
"                <temperatureMinimumTemperature>0.0</temperatureMinimumTemperature>\n" +
"            </CA_TemperatureMinimumTemperature>\n" +
"        </minimumTemperature>\n" +
```

```
"        <maximumTemperature>\n" +
"            <CA_TemperatureMaximumTemperature>\n" +
"                <temperatureMaximumTemperature>0.0</temperatureMaximumTemperature>\n" +
"            </CA_TemperatureMaximumTemperature>\n" +
"        </maximumTemperature>\n" +
"    </CA_TemperatureRange>\n" +
"    <CA_TestRange>\n" +
"        <calibrationType>laboratory</calibrationType>\n" +
"        <controlPointCA_TestRange>0.0</controlPointCA_TestRange>\n" +
"        <checkPoint>0.0</checkPoint>\n" +
"        <numberControlPoints>0</numberControlPoints>\n" +
"        <numberCheckPoints>0</numberCheckPoints>\n" +
"        <groundSamplingDistance uom=\"#m\">0.0</groundSamplingDistance>\n" +
"        <minimumElevationCA_TestRange uom=\"#m\">0.0</minimumElevationCA_TestRange> \n" +
"        <maximumElevationCA_TestRange uom=\"#m\">0.0</maximumElevationCA_TestRange>\n" +
"        <averageElevationCA_TestRange uom=\"#m\">0.0</averageElevationCA_TestRange> \n" +
"        <positionalError>\n" +
"            <CA_PositionalErrorCA_TestRange>\n" +
"                <errorXCA_TestRange uom=\"#m\">0.0</errorXCA_TestRange>\n" +
"                <errorYCA_TestRange uom=\"#m\">0.0</errorYCA_TestRange>\n" +
"                <errorZCA_TestRange uom=\"#m\">0.0</errorZCA_TestRange>\n" +
"                <errorXYCA_TestRange uom=\"#m\">0.0</errorXYCA_TestRange>\n" +
"                <errorXYZCA_TestRange uom=\"#m\">0.0</errorXYZCA_TestRange>\n" +
"                <pointTypeCA_TestRange>controlPoint</pointTypeCA_TestRange>\n" +
"                <errorTypeCA_TestRange>standardDeviation</errorTypeCA_TestRange>\n" +
"                <quantityTypeCA_TestRange>minimum</quantityTypeCA_TestRange>\n" +
"            </CA_PositionalErrorCA_TestRange>\n" +
"        </positionalError>\n" +
"        <lengthOfTestrange uom=\"#m\">0.0</lengthOfTestrange>\n" +
"        <widthOfTestrange uom=\"#m\">0.0</widthOfTestrange>\n" +
"        <elevationChangeOfTestrange uom=\"#m\">0.0</elevationChangeOfTestrange>\n" +
"    </CA_TestRange>\n" +
"    <MI_Instrument>\n" +
"        <citationMI_Instrument>\n" +
"            <CI_CitationMI_Instrument>\n" +
"                <titleMI_Instrument>name by which the cited resource is
known</titleMI_Instrument>\n" +
"                <alternateTitleMI_Instrument>short name or other language name by which the
cited information is known</alternateTitleMI_Instrument>\n" +
"                <dateMI_Instrument>\n" +
"                    <CI_DateMI_Instrument>\n" +
"                        <dateCI_DateMI_Instrument>1-09-2015</dateCI_DateMI_Instrument>\n" +
"                        <dateTypeMI_Instrument>creation</dateTypeMI_Instrument>\n" +
"                    </CI_DateMI_Instrument>\n" +
"                </dateMI_Instrument>\n" +
"                <editionMI_Instrument>version of the cited
resource</editionMI_Instrument>\n" +
"                <editionDateMI_Instrument>\n" +
"
<dateEditionDateMI_Instrument>1-09-2015</dateEditionDateMI_Instrument>\n" +
"                </editionDateMI_Instrument>\n" +
"                <identifierMI_Instrument>\n" +
"                    <MD_IdentifierMI_Instrument>\n" +
"                        <authorityMI_Instrument>person or party responsible for maintenance
of the namespace</authorityMI_Instrument>\n" +
"                        <codeMI_Instrument>alphanumeric value identifying an instance in the
namespace</codeMI_Instrument>\n" +
"                    </MD_IdentifierMI_Instrument>\n" +
"                </identifierMI_Instrument>\n" +
"                <citedResponsiblePartyMI_Instrument>\n" +
"                    <CI_ResponsiblePartyMI_Instrument>\n" +
"                        <individualNameMI_Instrument>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameMI_Instrument>\n" +
"                        <organisationNameMI_Instrument>name of the responsible
organization</organisationNameMI_Instrument>\n" +
"                        <positionNameMI_Instrument>role or position of the responsible
person</positionNameMI_Instrument>\n" +
```

```
"                        <contactInfoMI_Instrument>\n" +
"                            <CI_ContactMI_Instrument>\n" +
"                                <phoneMI_Instrument>\n" +
"                                    <CI_TelephoneMI_Instrument>\n" +
"                                        <voiceMI_Instrument>telephone number by which
individuals can speak to the responsible organization or individual</voiceMI_Instrument>\n" +
"                                        <facsimileMI_Instrument>telephone number of a
facsimile machine for the responsible organization or individual</facsimileMI_Instrument>\n" +
"                                    </CI_TelephoneMI_Instrument>\n" +
"                                </phoneMI_Instrument>\n" +
"                                <addressMI_Instrument>\n" +
"                                    <CI_AddressMI_Instrument>\n" +
"                                        <deliveryPointMI_Instrument>address line for the
location</deliveryPointMI_Instrument>\n" +
"                                        <cityMI_Instrument>city of the
location</cityMI_Instrument>\n" +
"                                        <administrativeAreaMI_Instrument>state, province of
the location</administrativeAreaMI_Instrument>\n" +
"                                        <postalCodeMI_Instrument>ZIP or other postal
code</postalCodeMI_Instrument>\n" +
"                                        <countryMI_Instrument>country of the physical
address</countryMI_Instrument>\n" +
"                                        <electronicMailAddressMI_Instrument>telephone number
of a facsimile machine for the responsible organization or
individual</electronicMailAddressMI_Instrument>\n" +
"                                    </CI_AddressMI_Instrument>\n" +
"                                </addressMI_Instrument>\n" +
"                                <onlineResourceMI_Instrument>\n" +
"                                    <CI_OnlineResourceMI_Instrument>\n" +
"                                        <linkageMI_Instrument>location (address) for on-line
access using a Uniform Resource Locator address or similar addressing
scheme</linkageMI_Instrument>\n" +
"                                        <protocolMI_Instrument>connection protocol to be
used</protocolMI_Instrument>\n" +
"                                        <applicationProfileMI_Instrument>name of an
application profile that can be used with the online
resource</applicationProfileMI_Instrument>\n" +
"                                        <nameCI_OnlineResourceMI_Instrument>name of the
online resource</nameCI_OnlineResourceMI_Instrument>\n" +
"                                        <descriptionCI_OnlineResourceMI_Instrument>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceMI_Instrument>\n" +
"
<functionMI_Instrument>download</functionMI_Instrument>\n" +
"                                    </CI_OnlineResourceMI_Instrument>\n" +
"                                </onlineResourceMI_Instrument>\n" +
"                                <hoursOfServiceMI_Instrument>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceMI_Instrument>\n" +
"                                <contactInstructionsMI_Instrument>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsMI_Instrument>\n" +
"                            </CI_ContactMI_Instrument>\n" +
"                        </contactInfoMI_Instrument>\n" +
"                        <roleMI_Instrument>resourceProvider</roleMI_Instrument>\n" +
"                    </CI_ResponsiblePartyMI_Instrument>\n" +
"                </citedResponsiblePartyMI_Instrument>\n" +
"
<presentationFormMI_Instrument>documentDigital</presentationFormMI_Instrument>\n" +
"                <seriesMI_Instrument>\n" +
"                    <CI_SeriesMI_Instrument>\n" +
"                        <nameCI_SeriesMI_Instrument>name of the series, or aggregate
dataset, of which the dataset is a part</nameCI_SeriesMI_Instrument>\n" +
"                        <issueIdentificationMI_Instrument>information identifying the issue
of the series</issueIdentificationMI_Instrument>\n" +
"                        <pageMI_Instrument>details on which pages of the publication the
article was published</pageMI_Instrument>\n" +
```

```
"                    </CI_SeriesMI_Instrument>\n" +
"                </seriesMI_Instrument>\n" +
"                <otherCitationDetailsMI_Instrument>other information required to complete
the citation that is not recorded elsewhere</otherCitationDetailsMI_Instrument>\n" +
"                <collectiveTitleMI_Instrument>common title with holdings
note</collectiveTitleMI_Instrument>\n" +
"                <ISBNMI_Instrument>international Standard Book Number</ISBNMI_Instrument>\n" +
"                <ISSNMI_Instrument>international Standard Serial
Number</ISSNMI_Instrument>\n" +
"            </CI_CitationMI_Instrument> \n" +
"        </citationMI_Instrument> \n" +
"        <identifierMI_Instrument1>\n" +
"            <MD_IdentifierMI_Instrument1>\n" +
"                <authorityMI_Instrument1>person or party responsible for maintenance of the
namespace</authorityMI_Instrument1>\n" +
"                <codeMI_Instrument1>alphanumeric value identifying an instance in the
namespace</codeMI_Instrument1>\n" +
"            </MD_IdentifierMI_Instrument1>      \n" +
"        </identifierMI_Instrument1>\n" +
"        <typeMI_Instrument>name of the type of instrument</typeMI_Instrument>\n" +
"        <descriptionMI_Instrument>textual description of the
instrument</descriptionMI_Instrument>\n" +
"    </MI_Instrument>\n" +
"    <SD_AngleAttitudeSD_AngleAttitude>\n" +
"        <rotatedAxesSD_AngleAttitude>yes</rotatedAxesSD_AngleAttitude>\n" +
"        <rotationAngleXSD_AngleAttitude uom=\"#m\">0.0</rotationAngleXSD_AngleAttitude>\n" +
"        <rotationAngleYSD_AngleAttitude uom=\"#m\">0.0</rotationAngleYSD_AngleAttitude>\n" +
"        <rotationAngleZSD_AngleAttitude uom=\"#m\">0.0</rotationAngleZSD_AngleAttitude>\n" +
"        <rotationSequenceSD_AngleAttitude>XYZ</rotationSequenceSD_AngleAttitude>\n" +
"    </SD_AngleAttitudeSD_AngleAttitude>\n" +
"    <SD_ArrayDimension>\n" +
"        <nameSD_ArrayDimension>name of a detector array</nameSD_ArrayDimension>\n" +
"        <sizeSD_ArrayDimension>0</sizeSD_ArrayDimension>\n" +
"    </SD_ArrayDimension>\n" +
"    <SD_Calibration>\n" +
"        <calibrationAgency>\n" +
"            <CI_ResponsiblePartySD_Calibration>\n" +
"                <individualNameSD_Calibration>name of the responsible person- surname,given
name, title separated by a delimiter</individualNameSD_Calibration>\n" +
"                <organisationNameSD_Calibration>name of the responsible
organization</organisationNameSD_Calibration>\n" +
"                <positionNameSD_Calibration>role or position of the responsible
person</positionNameSD_Calibration>\n" +
"                <contactInfoSD_Calibration>\n" +
"                    <CI_ContactSD_Calibration>\n" +
"                        <phoneSD_Calibration>\n" +
"                            <CI_TelephoneSD_Calibration>\n" +
"                                <voiceSD_Calibration>telephone number by which individuals
can speak to the responsible organization or individual</voiceSD_Calibration>\n" +
"                                <facsimileSD_Calibration>telephone number of a facsimile
machine for the responsible organization or individual</facsimileSD_Calibration>\n" +
"                            </CI_TelephoneSD_Calibration>\n" +
"                        </phoneSD_Calibration>\n" +
"                        <addressSD_Calibration>\n" +
"                            <CI_AddressSD_Calibration>\n" +
"                                <deliveryPointSD_Calibration>address line for the
location</deliveryPointSD_Calibration>\n" +
"                                <citySD_Calibration>city of the
location</citySD_Calibration>\n" +
"                                <administrativeAreaSD_Calibration>state, province of the
location</administrativeAreaSD_Calibration>\n" +
"                                <postalCodeSD_Calibration>ZIP or other postal
code</postalCodeSD_Calibration>\n" +
"                                <countrySD_Calibration>country of the physical
address</countrySD_Calibration>\n" +
"                                <electronicMailAddressSD_Calibration>telephone number of a
facsimile machine for the responsible organization or
```

```
individual</electronicMailAddressSD_Calibration>\n" +
"                           </CI_AddressSD_Calibration>\n" +
"                       </addressSD_Calibration>\n" +
"                       <onlineResourceSD_Calibration>\n" +
"                           <CI_OnlineResourceSD_Calibration>\n" +
"                               <linkageSD_Calibration>location (address) for on-line access
using a Uniform Resource Locator address or similar addressing
scheme</linkageSD_Calibration>\n" +
"                               <protocolSD_Calibration>connection protocol to be
used</protocolSD_Calibration>\n" +
"                               <applicationProfileSD_Calibration>name of an application
profile that can be used with the online resource</applicationProfileSD_Calibration>\n" +
"                               <nameCI_OnlineResourceSD_Calibration>name of the online
resource</nameCI_OnlineResourceSD_Calibration>\n" +
"                               <descriptionCI_OnlineResourceSD_Calibration>detailed text
description of what the online resource
is/does</descriptionCI_OnlineResourceSD_Calibration>\n" +
"                               <functionSD_Calibration>download</functionSD_Calibration>\n" +
"                           </CI_OnlineResourceSD_Calibration>\n" +
"                       </onlineResourceSD_Calibration>\n" +
"                       <hoursOfServiceSD_Calibration>time period (including time zone) when
individuals can contact the organization or individual</hoursOfServiceSD_Calibration>\n" +
"                       <contactInstructionsSD_Calibration>supplemental instructions on how
or when to contact the individual or organization</contactInstructionsSD_Calibration>\n" +
"                   </CI_ContactSD_Calibration>\n" +
"               </contactInfoSD_Calibration>\n" +
"               <roleSD_Calibration>resourceProvider</roleSD_Calibration>\n" +
"           </CI_ResponsiblePartySD_Calibration>    \n" +
"       </calibrationAgency>\n" +
"       <calibrationDate>1-09-2015</calibrationDate>\n" +
"   </SD_Calibration>\n" +
"   <SD_DetectorArray>\n" +
"       <numberOfDimensions>0</numberOfDimensions>\n" +
"       <arrayOrigin>0.0</arrayOrigin>\n" +
"       <arrayDimensions1>\n" +
"           <SD_ArrayDimension1>\n" +
"               <nameSD_ArrayDimension1>name of a detector array</nameSD_ArrayDimension1>\n" +
"               <sizeSD_ArrayDimension1>0</sizeSD_ArrayDimension1>\n" +
"           </SD_ArrayDimension1>\n" +
"       </arrayDimensions1>\n" +
"       <arrayDimensions2>\n" +
"           <SD_ArrayDimension2>\n" +
"               <nameSD_ArrayDimension2>name of a detector array</nameSD_ArrayDimension2>\n" +
"               <sizeSD_ArrayDimension2>0</sizeSD_ArrayDimension2>\n" +
"           </SD_ArrayDimension2>\n" +
"       </arrayDimensions2>\n" +
"       <offsetVectors1>0.0</offsetVectors1>\n" +
"       <offsetVectors2>0.0</offsetVectors2>\n" +
"       <detectorSize1>0.0</detectorSize1>\n" +
"       <detectorSize2>0.0</detectorSize2>\n" +
"       <detectorShape>square</detectorShape>\n" +
"       <distortion>\n" +
"           <SD_Distortion>\n" +
"               <princPointOfSymmetry>0.0</princPointOfSymmetry>\n" +
"               <qualityOfPrincPointOfSymmetry>\n" +
"                   <DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"                       <standaloneQualityReportDetailsSD_Distortion>description of the data
quality element</standaloneQualityReportDetailsSD_Distortion>\n" +
"                   </DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"               </qualityOfPrincPointOfSymmetry>\n" +
"           </SD_Distortion>\n" +
"       </distortion>\n" +
"   </SD_DetectorArray>\n" +
"   <SD_Distortion>\n" +
"       <princPointOfSymmetry>0.0</princPointOfSymmetry>\n" +
"       <qualityOfPrincPointOfSymmetry>\n" +
"           <DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
```

```
"                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
element</standaloneQualityReportDetailsSD_Distortion>\n" +
"            </DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"        </qualityOfPrincPointOfSymmetry>\n" +
"    </SD_Distortion>\n" +
"    <SD_DistortionPolynomial>\n" +
"        <princPointOfSymmetry>0.0</princPointOfSymmetry>\n" +
"        <qualityOfPrincPointOfSymmetry>\n" +
"            <DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
element</standaloneQualityReportDetailsSD_Distortion>\n" +
"            </DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"        </qualityOfPrincPointOfSymmetry>\n" +
"        <polynomialDecentering>\n" +
"            <SD_PolynomialFunction1>\n" +
"                <resultDimension1>column</resultDimension1>\n" +
"            </SD_PolynomialFunction1>\n" +
"        </polynomialDecentering>\n" +
"        <polynomialRadial>\n" +
"            <SD_PolynomialFunction2>\n" +
"                <resultDimension2>column</resultDimension2>\n" +
"            </SD_PolynomialFunction2>\n" +
"        </polynomialRadial>\n" +
"        <qualityOfPolynomialRadial>\n" +
"            <DQ_PositionalAccuracySD_DistortionPolynomial>\n" +
"                <standaloneQualityReportDetailsSD_DistortionPolynomial>description of the
data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial>\n" +
"            </DQ_PositionalAccuracySD_DistortionPolynomial>     \n" +
"        </qualityOfPolynomialRadial>\n" +
"        <qualityOfPolynomialDecentering>\n" +
"            <DQ_PositionalAccuracySD_DistortionPolynomial1>\n" +
"                <standaloneQualityReportDetailsSD_DistortionPolynomial1>description of the
data quality element</standaloneQualityReportDetailsSD_DistortionPolynomial1>\n" +
"            </DQ_PositionalAccuracySD_DistortionPolynomial1>        \n" +
"        </qualityOfPolynomialDecentering>\n" +
"    </SD_DistortionPolynomial>\n" +
"    <SD_DistortionTable>\n" +
"        <princPointOfSymmetry>0.0</princPointOfSymmetry>\n" +
"        <qualityOfPrincPointOfSymmetry>\n" +
"            <DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"                <standaloneQualityReportDetailsSD_Distortion>description of the data quality
element</standaloneQualityReportDetailsSD_Distortion>\n" +
"            </DQ_QuantitativeAttributeAccuracySD_Distortion>\n" +
"        </qualityOfPrincPointOfSymmetry>\n" +
"        <rows>1</rows>\n" +
"        <columns>1</columns>\n" +
"        <xOffset>0</xOffset>\n" +
"        <yOffset>0</yOffset>\n" +
"        <xSpacing>0</xSpacing>\n" +
"        <ySpacing>0</ySpacing>\n" +
"        <distortionValues>0.0</distortionValues>\n" +
"    </SD_DistortionTable>\n" +
"    <SD_MatrixAttitude>\n" +
"        <matrixElements1>0.0</matrixElements1>\n" +
"        <matrixElements2>0.0</matrixElements2>\n" +
"        <matrixElements3>0.0</matrixElements3>\n" +
"        <matrixElements4>0.0</matrixElements4>\n" +
"        <matrixElements5>0.0</matrixElements5>\n" +
"        <matrixElements6>0.0</matrixElements6>\n" +
"        <matrixElements7>0.0</matrixElements7>\n" +
"        <matrixElements8>0.0</matrixElements8>\n" +
"        <matrixElements9>0.0</matrixElements9>\n" +
"    </SD_MatrixAttitude>\n" +
"    <SD_OpticalSystem>\n" +
"        <calibratedFocalLength uom=\"#m\">0.0</calibratedFocalLength>\n" +
"        <qualityOfCalibratedFocalLength>\n" +
"            <DQ_QuantitativeAttributeAccuracySD_OpticalSystem>\n" +
```

```
"               <standaloneQualityReportDetailsSD_OpticalSystem>description of n the data
quality element</standaloneQualityReportDetailsSD_OpticalSystem>\n" +
"           </DQ_QuantitativeAttributeAccuracySD_OpticalSystem>\n" +
"       </qualityOfCalibratedFocalLength>\n" +
"       <princPointAutocoll>0.0</princPointAutocoll>\n" +
"       <covPrincPtAutocoll>\n" +
"           <DQ_PositionalAccuracySD_OpticalSystem1>\n" +
"               <standaloneQualityReportDetailsSD_OpticalSystem1>description of the data
quality element</standaloneQualityReportDetailsSD_OpticalSystem1>\n" +
"           </DQ_PositionalAccuracySD_OpticalSystem1>       \n" +
"       </covPrincPtAutocoll>\n" +
"   </SD_OpticalSystem>\n" +
"   <SD_Sensor>\n" +
"       <citationSD_Calibration>\n" +
"           <SD_Calibration>\n" +
"               <calibrationAgency>\n" +
"                   <CI_ResponsiblePartySD_Calibration>\n" +
"                       <individualNameSD_Calibration>name of the responsible person-
surname,given name, title separated by a delimiter</individualNameSD_Calibration>\n" +
"                       <organisationNameSD_Calibration>name of the responsible
organization</organisationNameSD_Calibration>\n" +
"                       <positionNameSD_Calibration>role or position of the responsible
person</positionNameSD_Calibration>\n" +
"                       <contactInfoSD_Calibration>\n" +
"                           <CI_ContactSD_Calibration>\n" +
"                               <phoneSD_Calibration>\n" +
"                                   <CI_TelephoneSD_Calibration>\n" +
"                                       <voiceSD_Calibration>telephone number by which
individuals can speak to the responsible organization or individual</voiceSD_Calibration>\n" +
"                                       <facsimileSD_Calibration>telephone number of a
facsimile machine for the responsible organization or
individual</facsimileSD_Calibration>\n" +
"                                   </CI_TelephoneSD_Calibration>\n" +
"                               </phoneSD_Calibration>\n" +
"                               <addressSD_Calibration>\n" +
"                                   <CI_AddressSD_Calibration>\n" +
"                                       <deliveryPointSD_Calibration>address line for the
location</deliveryPointSD_Calibration>\n" +
"                                       <citySD_Calibration>city of the
location</citySD_Calibration>\n" +
"                                       <administrativeAreaSD_Calibration>state, province of
the location</administrativeAreaSD_Calibration>\n" +
"                                       <postalCodeSD_Calibration>ZIP or other postal
code</postalCodeSD_Calibration>\n" +
"                                       <countrySD_Calibration>country of the physical
address</countrySD_Calibration>\n" +
"                                       <electronicMailAddressSD_Calibration>telephone
number of a facsimile machine for the responsible organization or
individual</electronicMailAddressSD_Calibration>\n" +
"                                   </CI_AddressSD_Calibration>\n" +
"                               </addressSD_Calibration>\n" +
"                               <onlineResourceSD_Calibration>\n" +
"                                   <CI_OnlineResourceSD_Calibration>\n" +
"                                       <linkageSD_Calibration>location (address) for
on-line access using a Uniform Resource Locator address or similar addressing
scheme</linkageSD_Calibration>\n" +
"                                       <protocolSD_Calibration>connection protocol to be
used</protocolSD_Calibration>\n" +
"                                       <applicationProfileSD_Calibration>name of an
application profile that can be used with the online
resource</applicationProfileSD_Calibration>\n" +
"                                       <nameCI_OnlineResourceSD_Calibration>name of the
online resource</nameCI_OnlineResourceSD_Calibration>\n" +
"                                       <descriptionCI_OnlineResourceSD_Calibration>detailed
text description of what the online resource
is/does</descriptionCI_OnlineResourceSD_Calibration>\n" +
"
```

```
<functionSD_Calibration>download</functionSD_Calibration>\n" +
"                                    </CI_OnlineResourceSD_Calibration>\n" +
"                                </onlineResourceSD_Calibration>\n" +
"                                <hoursOfServiceSD_Calibration>time period (including time
zone) when individuals can contact the organization or
individual</hoursOfServiceSD_Calibration>\n" +
"                                <contactInstructionsSD_Calibration>supplemental instructions
on how or when to contact the individual or
organization</contactInstructionsSD_Calibration>\n" +
"                            </CI_ContactSD_Calibration>\n" +
"                        </contactInfoSD_Calibration>\n" +
"                        <roleSD_Calibration>resourceProvider</roleSD_Calibration>\n" +
"                    </CI_ResponsiblePartySD_Calibration>    \n" +
"                </calibrationAgency>\n" +
"                <calibrationDate>1-09-2015</calibrationDate>\n" +
"            </SD_Calibration>\n" +
"        </citationSD_Calibration>\n" +
"        <mode>type of observation being made by sensor</mode>\n" +
"        <operationalBand>\n" +
"            <MI_Band>\n" +
"                <bandBoundaryDefinition>3dB</bandBoundaryDefinition>\n" +
"                <nominalSpatialResolution>0.0</nominalSpatialResolution>\n" +
"                <transferFunctionType>linear</transferFunctionType>\n" +
"                <transmittedPolarization>horizontal</transmittedPolarization>\n" +
"                <detectedPolarization>horizontal</detectedPolarization>\n" +
"            </MI_Band>      \n" +
"        </operationalBand>\n" +
"    </SD_Sensor>\n" +
"</Norm>";
    }
}
```

Anhang E

Das während der endgültigen Testnutzung erstellte Kalibrierprotokoll (*Report*)

Calibration Protocol

Camera Calibration Certificate
No: DMC II 250 – 040

For

Hochschule Neubrandenburg
Brodaer Straße 2
17033 Neubrandenburg
Germany

Camera	DMC II 250 – 040
Manufacturer	Z/I Imaging GmbH
Manufacturer's city	D-73431 Aalen
Manufacturer's country	Germany
Reference	PAN
Serial Number	00121780
Date of Calibration	31-01-2014
Date of Report	20-02-2014

Calibration performed at: Carl Zeiss Jena,
Germany

This camera system is certified by Z/I Imaging and is fully functional within its specifications and tolerances.

Date of Calibration: 31-01-2014	Date of Certification: 20-02-2014

Senior Software Developer	Technical Consultant

Camera Serial Numbers and Burn-In flight

Camera Head	Serial number	Calib. Date
PAN	00121780	31-01-2014
MS1 (NIR)	00118794	31-01-2014
MS2 (Blue)	00122306	31-01-2014
MS3 (Red)	00121901	31-01-2014
MS4 (Green)	00122301	31-01-2014

Burn-In flight performed: 31-01-2014

Test block configuration

Photo Scale	1:8928.6
Flying Height [m]	1000
Flying Altitude [m]	1450
Run-Spacing [m]	419.2
Base-Length [m]	210.2
Number of Exposures	54
Side-lap [%]	50
End-lap [%]	70
Terrain Height [m]	450.0
Number of strips	6
Photos in one strip (N-S)	18
Photos in one strip (W-E)	36
Photos Used	54
Control Point Used	5
Check Points Used	44
GSD [cm]	5.0

Aerial triangulation statistic results:

Parameter	X/Omega	Y/Phi	Z/Kappa
RMS Control	0.005	0.013	0.007
RMS Check	0.023	0.022	0.037
RMS Limits	0.050	0.050	0.050
Max Grund Residual	0.007	0.019	0.009
Residual Limits	0.050	0.050	0.050
Mean Std Dev Object	0.0	0.0	0.0
RMS Photo Position	0.0	0.0	0.0
RMS Photo Attitude	0.0	0.0	0.0
Mean Std Dev Photo Position	0.0	0.0	0.0
Mean Std Dev Photo Attitude	0.0	0.0	0.0

Current Count

Control Points Used: 5

Check Points Used: 44

Photos Used: 54

Photos Not Used: 0

Image Points Used: 13914

Key Statistics

Sigma [um]: 1.2

RMS Image (x) [µm]: 0.8

RMS Image (y) [um]: 1.1

Number of iteration: 2

Degrees of Freedom: 16629

Gross Image Blunders: 0

Gross Control Blunders: 0

Image Blunders: 0

Solution Status: Solution Successful

Project Settings

Linear: Meter

Angular: Degrees
Refraction: no
Curvature: no
Coordinate Reference System: Deutsche Hauptdreiecksnetz-Gauss-Krüger (3-degree) (m)

The results of the aerial triangulation were generated with The results of the aerial triangulation were generated with ImageStation Automatic Triangulation (ISAT), Version 6.2, from Intergraph Corp.The maximum RMS in check points is < 0.5 GSD in x, < 0.5 GSD in y and < 0.7 GSD in z.
Aerial Triangulation performed by: Technical Consultant
Date of Aerial Triangulation: 20-02-2014

Geometric Calibration

The output image geometry is based on the PAN Camera head (reference head = master camera). All other camera heads are registered and aligned to this head. Aerial triangulation checks overall system performance based on.

Output image

Reference Camera	PAN
Serial Number	00121780
Number of rows [pixels]	16768
Number of columns [pixels]	14016
Pixel Size X [µm]	5600
Pixel Size Y [µm]	5600
Image Size X [mm]	939008
Image Size Y [mm]	784896
Focal Length [mm]	112.0744
Quality of the calibrated focal length [+/- value in mm]	0.002
Principal Point X [mm]	0.0229
Principal Point Y [mm]	-0.0086
Covariance of the location of the principal point [+/- value in mm]	0.002

The geometric calibration takes place at Carl Zeiss Jena on a certified test stand. More than 800 “light targets”, projected on 28 lines that are distributed diagonally on the focal plane, are automatically measured by finding their centers light with a precision of less than 1/10 of a pixel. The light targets are projected from the “infinity” by using a collimator.

Geometric Calibration

Image Residuals

The geometric error remaining after stitching the multi camera-head images to one large image is 1.5 microns and the RMSE value is below 0.5 microns.

Optical System

Modulation Transfer Function, MTF of PAN Camera (Reference)

DMC II 250 – 040 PAN-MTF Polychromatic F/5.6; 112 [mm]-Temperature Stability

Modulation Transfer Function	Temperature
0.0	0.0

The MTF measurement is camera type specific and shows variation of the MTF within the specifed temperature range.

This is a camera type specific measurement.

Radiometric Calibration

Sensitivity of PAN camera (Reference)

DMC II 250 – 040 Relative Spectral Response

Relative Spectral Response	Wavelength [nm]
0.0	350
0.0	850
0.0	400
0.0	770
0.1	410
0.1	740
0.2	420
0.2	740
0.4	440
0.4	710
0.6	460
0.6	680
0.8	470
0.8	630
1.0	540

The sensitivity shows the spectral response curve of the single camera head including the optical system (optics, filter) and the sensor response. The DMC II 250 is calibrated with respect to the absolute spectrometer. This allows computing pixel radiance values from pixels digital numbers and is a camera type specific calibration.

This is a camera type specific measurement.

Radiometric Calibration

Sensor Linearity (Reference)

The sensor linearity is measured in the Lab with calibrated spectrometer. This is a camera type specific calibration.

The deviation from the linearity is below 1%.

This is a camera type specific measurement.

Radiometric Calibration

Sensor Noise (Reference)

Sensor noise shows image noise with respect to the image center measured at an aperture of 16 with exposure time of 16msec.

Sensor Signal to Noise Ratio

Corrected-NoCal

Signal to Noise Ratio	Spectrometer-measured Radiance
35	0.5
60	1.2
70	1.6
80	2.2
95	3.2
115	4.4
130	5.5
145	6.5
147	7.0
152	7.5
155	8.2

Corrected-Cal

Signal to Noise Ratio	Spectrometer-measured Radiance
70	1.6
85	2.2
100	3.2
125	4.4
145	5.5
155	6.5
165	7.0
170	7.5
175	8.2

This is a camera type specific calibration.

Radiometric Calibration

Aperture Correction (Reference)

Camera PAN (00121780)

The light fall off to the border due the influence of the optics depends on the aperture used. Therefore this calibration approach delivers individual calibration images for each aperture (Full F-Stop). In general the light fall off is a function of the image height (radial distance from center).
The tables below shows the values from the upper left corner to the lower right corner of the calibration images.
Compensation of the light fall off can be measured after normalization and is within ±2.5% of the dynamic range.

Light fall off and correction after normalization for PAN sensor

PAN DMC II 250 – 040

Relative Grayvalue (Normalized to max) F11	Radius [mm]
1.0 1.0 1.0 1.0 1.0 1.0 1.0	-62 -40 -20 0 20 40 62

Relative Grayvalue (Normalized to max) F16	Radius [mm]
0.43 0.7 0.9 0.98 0.88 0.78 0.4	-62 -40 -20 0 20 40 62

Relative Grayvalue (Normalized to max) F22	Radius [mm]

0.45 0.7 0.9 0.98 0.88 0.70 0.42	-62 -40 -20 0 20 40 62

Relative Grayvalue (Normalized to max) F32	Radius [mm]
0.440 0.7 0.9 0.95 0.86 0.65 0.4	-62 -40 -20 0 20 40 62

Relative Grayvalue (Normalized to max) F5.6	Radius [mm]
0.36 0.75 0.94 1.0 0.9 0.7 0.3	-62 -40 -20 0 20 40 62

Relative Grayvalue (Normalized to max) F8	Radius [mm]
0.45 0.74 0.92 0.98 0.88 0.7 0.42	-62 -40 -20 0 20 40 62

This is a camera type specific calibration.

Radiometric Calibration

Defect Pixel

Camera PAN (00121780)

Defect pixels are detected during radiometric calibration and will be corrected during radiometric processing of the images. The quantity and cumulative percentage and specification of defects is described in Appendix “Defect Pixel Recognition”.

Revision of calibration: 65537
CCDRevision: 1
Date Number: 1334044116
Date: 140131

Number of defect pixels: 181
Number of defect clusters: 0
Number of defect columns: 2

Row	Column

909	32
3098	110
3043	123
13717	154
908	217
13582	380
13583	380
9503	449
434	455
435	455
2897	567
2897	568
9323	644
9324	644
9323	645
9324	645
10175	785
697	838
779	1151
13087	1302
10740	1409
4284	1610
14302	1746
955	2074
5758	2262
5759	2262
3209	2426
3209	2427
1926	2564
14397	2919
14398	2919
14399	2919
14397	2920
14398	2920
14399	2920
14397	2921
14398	2921
14541	3118
8416	3535
10290	3674
11162	3687
11162	3688
1288	3708
1286	3710
1288	3711
8937	3800
9672	3860
4413	3865
4365	3899
344	4050
3968	4751
3873	4864
2573	5786
5229	6046

5230
2012
2013
2014
11546
11546
11546
6269
6270
7327
362
4631
4634
4635
4630
4635
4635
4631
4633
3786
11979
12428
1159
1159
1160
3725
21
22
22
23
24
1818
512
14
7149
7151
7152
7152
32
33
34
32
33
34
1902
1903
11123
11125
11123
11123
11125
5513
2833
2831
6046
6631
6631
6631
6647
6648
6649
6654
6654
6654
6771
6968
6968
6969
6970
6970
6971
6972
6973
7378
7852
7876
9079
9080
9080
9144
9275
9275
9276
9276
9276
9689
9850
9994
10040
10042
10042
10043
10255
10255
10255
10256
10256
10256
10284
10284
10743
10743
10744
10745
10745
10787
11533
11534

2835	11534
2830	11535
2831	11535
2832	11535
2833	11535
2835	11535
2830	11536
2832	11536
2833	11536
2834	11536
2831	11537
2832	11537
2833	11537
2834	11537
2830	11538
2832	11538
2835	11538
1975	11570
1976	11570
1977	11570
1976	11571
1977	11571
1978	11571
1976	11572
1977	11572
1978	11572
1976	11573
1977	11573
1978	11573
8826	12453
8826	12454
8830	12454
410	12878
1819	13141
1818	13142
1819	13142
9446	13740
4286	13754
3331	13756
3332	13756
2509	14121
1795	14244
5095	14322
5096	14322
5094	14323
5097	14323
5096	14325
14128	14437
3572	14614
3572	14615
8110	14626
8110	14627
8110	14628
369	15151

370	15151
371	15151
372	15151
373	15151
373	15152
9734	15159
7786	15228
7376	15966
7375	15967
7375	15968
7377	15968
2230	16351
2230	16352
11610	16409
14335	16646
3126	16681
3127	16681
1511	16899
6662	16907

Optical System

Modulation Transfer Function, MTF of MS4 (Green)

DMC II 250 – 040 MS4 (Green)-MTF Polychromatic F/4.0; 45 [mm]-Temperature Stability

Modulation Transfer Function	Temperature
0.0	0.0

Radiometric Calibration

Sensitivity of MS4 (Green)

Spectral response curve of the single camera head.

DMC II 250 – 040 Relative Spectral Response

Relative Spectral Response	Wavelength [nm]
0.0	350
0.0	850
0.0	480
0.0	610
0.1	490
0.1	590
0.2	495
0.2	580
0.4	500
0.4	560
0.6	505
0.6	550
0.8	510
0.8	540
1.0	570

The sensitivity shows the spectral response curve of the single camera head including the optical system (optics, filter) and the sensor response. The DMC II 250 is calibrated with respect to the absolute spectrometer. This allows computing pixel radiance values from pixels digital numbers and is a camera type specific calibration.

Radiometric Calibration

Sensor Linearity (Reference)

The sensor linearity is measured in the Lab with calibrated spectrometer. This is a camera type specific calibration.

Below table shows the linearity of the raw sensor and after flat fielding:

Linearity

Intermediate

Grayvalue	Light (100= Saturated)
0	0
3000	20
6500	40
9500	60
13000	80
14500	90

Raw

Grayvalue	Light (100= Saturated)
500	0
3500	20
7000	40
10500	60
13500	80
15000	90

Senor Linearity from Light Level 0 (dark) to (100 % = Saturation)

The deviation from the linearity is below 1%.

Radiometric Calibration

Sensor Noise (Reference)

Sensor noise shows image noise with respect to the image center measured at an aperture of 8 with exposure time of 22msec. Sensor noise after calibration shall be less or equal 0.5% of radiometric resolution. At 14bit radiometric resolution 0.5% (of 16384) is equal to 82 gray values. This is a camera type specific calibration.

Image Noise

Sensor Noise before Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
20	1000
31	2000
45	4000
57	6000
68	8000
78	10000
85	12000
87	12500

Sensor Noise after Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
21	1000
28	2000
41	4000
51	6000
58	8000
65	10000
72	12000
78	14000
83	15500

Radiometric Calibration

Aperture Correction

MS4 (Green) (00122301)

The light fall off to the border due the influence of the optics depends on the aperture used. Therefore this calibration approach delivers individual calibration images for each aperture (Full F-Stop). In general the light fall off is a function of the image height (radial distance from center).
The tables below shows the values from the upper left corner to the lower right corner of the calibration images.

MS4 (Green) DMC II 250 – 040

Relative Grayvalue (Normalized to max) F11	Radius [mm]
0.52 0.78 0.92 0.98 0.93 0.78 0.53	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F16	Radius [mm]
0.52 0.78 0.92 0.98 0.93 0.78 0.53	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F22	Radius [mm]

0.52	-33
0.78	-20
0.92	-10
0.98	0
0.93	10
0.78	20
0.53	33

Relative Grayvalue (Normalized to max) F2.8	Radius [mm]
0.47	-33
0.68	-20
0.90	-10
0.98	0
0.88	10
0.75	20
0.48	33

Relative Grayvalue (Normalized to max) F4	Radius [mm]
0.52	-33
0.78	-20
0.92	-10
0.98	0
0.93	10
0.78	20
0.53	33

Relative Grayvalue (Normalized to max) F5.6	Radius [mm]
0.52	-33
0.78	-20
0.92	-10
0.98	0
0.93	10
0.78	20
0.53	33

Relative Grayvalue (Normalized to max) F8	Radius [mm]
0.52	-33
0.78	-20
0.92	-10
0.98	0
0.93	10
0.78	20
0.53	33

This is a camera type specific calibration.

Radiometric Calibration

Defect Pixel

MS4 (Green) (00122301)

Defect pixels are detected during radiometric calibration and will be corrected during radiometric processing of the images. The quantity and cumulative percentage and specification of defects is described in Appendix “Defect Pixel Recognition”.

Revision of calibration: 65537
CCDRevision: 1
Date Number: 1352105013
Date: 140131

Number of defect pixels: 2
Number of defect clusters: 0
Number of defect columns: 0

Row	Column
2534	5702
2535	5702

This is a camera type specific calibration.

Optical System

Modulation Transfer Function, MTF of MS3 (Red)

DMC II 250 – 040 MS3 (Red)-MTF Polychromatic F/4.0; 45 [mm]-Temperature Stability

Modulation Transfer Function	Temperature
0.0	0.0

Radiometric Calibration

Sensitivity of MS3 (Red)

Spectral response curve of the single camera head.

DMC II 250 – 040 Relative Spectral Response

Relative Spectral Response	Wavelength [nm]
0.0	350
0.0	850
0.0	580
0.0	720
0.1	505
0.1	710
0.2	510
0.2	690
0.4	595
0.4	670
0.6	600
0.6	655
0.8	610
0.8	640
1.0	620

The sensitivity shows the spectral response curve of the single camera head including the optical system (optics, filter) and the sensor response. The DMC II 250 is calibrated with respect to the absolute spectrometer. This allows computing pixel radiance values from pixels digital numbers and is a camera type specific calibration.

Radiometric Calibration

Sensor Linearity (Reference)

The sensor linearity is measured in the Lab with calibrated spectrometer. This is a camera type specific calibration.

Below table shows the linearity of the raw sensor and after flat fielding:

Linearity

Intermediate

Grayvalue	Light (100= Saturated)
0	0
3000	20
6500	40
9500	60
13000	80
14500	90

Raw

Grayvalue	Light (100= Saturated)
500	0
3500	20
7000	40
10500	60
13500	80
15000	90

Senor Linearity from Light Level 0 (dark) to (100 % = Saturation)

The deviation from the linearity is below 1%.

Radiometric Calibration

Sensor Noise (Reference)

Sensor noise shows image noise with respect to the image center measured at an aperture of 8 with exposure time of 22msec. Sensor noise after calibration shall be less or equal 0.5% of radiometric resolution. At 14bit radiometric resolution 0.5% (of 16384) is equal to 82 gray values. This is a camera type specific calibration.

Image Noise

Sensor Noise before Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
20	1000
31	2000
45	4000
57	6000
68	8000
78	10000
85	12000
87	12500

Sensor Noise after Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
21	1000
28	2000
41	4000
51	6000
58	8000
65	10000
72	12000
78	14000
83	15500

Radiometric Calibration

Aperture Correction

MS3 (Red) (00121901)

The light fall off to the border due the influence of the optics depends on the aperture used. Therefore this calibration approach delivers individual calibration images for each aperture (Full F-Stop). In general the light fall off is a function of the image height (radial distance from center).
The tables below shows the values from the upper left corner to the lower right corner of the calibration images.

MS3 (Red) DMC II 250 – 040

Relative Grayvalue (Normalized to max) F11	Radius [mm]
0.5 0.78 0.92 0.98 0.92 0.77 0.49	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F16	Radius [mm]
0.5 0.78 0.92 0.98 0.92 0.77 0.49	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F22	Radius [mm]

0.5 0.78 0.92 0.98 0.92 0.77 0.48	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F2.8	Radius [mm]
0.5 0.78 0.92 0.98 0.92 0.77 0.49	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F4	Radius [mm]
0.53 0.78 0.92 0.98 0.92 0.77 0.49	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F5.6	Radius [mm]
0.5 0.78 0.92 0.98 0.92 0.77 0.49	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F8	Radius [mm]
0.53 0.78 0.92 0.98 0.92 0.77 0.49	-33 -20 -10 0 10 20 33

This is a camera type specific calibration.

Radiometric Calibration

Defect Pixel

MS3 (Red) (00121901)

Defect pixels are detected during radiometric calibration and will be corrected during radiometric processing of the images. The quantity and cumulative percentage and specification of defects is described in Appendix “Defect Pixel Recognition”.

Revision of calibration: 65537
CCDRevision: 1
Date Number: 1352103962
Date: 140131

Number of defect pixels: 1
Number of defect clusters: 0
Number of defect columns: 0

Row	Column
5403	801

This is a camera type specific calibration.

Optical System

Modulation Transfer Function, MTF of MS2 (Blue)

DMC II 250 – 040 MS2 (Blue)-MTF Polychromatic F/4.0; 45 [mm]-Temperature Stability

Modulation Transfer Function	Temperature
0.0	0.0

Radiometric Calibration

Sensitivity of MS2 (Blue)

Spectral response curve of the single camera head.

DMC II 250 – 040 Relative Spectral Response

Relative Spectral Response	Wavelength [nm]
0.0	350
0.0	850
0.0	370
0.0	515
0.1	390
0.1	505
0.2	405
0.2	500
0.4	420
0.4	490
0.6	430
0.6	485
0.8	450
0.8	480
1.0	460

The sensitivity shows the spectral response curve of the single camera head including the optical system (optics, filter) and the sensor response. The DMC II 250 is calibrated with respect to the absolute spectrometer. This allows computing pixel radiance values from pixels digital numbers and is a camera type specific calibration.

Radiometric Calibration

Sensor Linearity (Reference)

The sensor linearity is measured in the Lab with calibrated spectrometer. This is a camera type specific calibration.

Below table shows the linearity of the raw sensor and after flat fielding:

Linearity

Intermediate

Grayvalue	Light (100= Saturated)
0	0
3000	20
6500	40
9500	60
13000	80
14500	90

Raw

Grayvalue	Light (100= Saturated)
500	0
3500	20
7000	40
10500	60
13500	80
15000	90

Senor Linearity from Light Level 0 (dark) to (100 % = Saturation)

The deviation from the linearity is below 1%.

Radiometric Calibration

Sensor Noise (Reference)

Sensor noise shows image noise with respect to the image center measured at an aperture of 8 with exposure time of 22msec. Sensor noise after calibration shall be less or equal 0.5% of radiometric resolution. At 14bit radiometric resolution 0.5% (of 16384) is equal to 82 gray values. This is a camera type specific calibration.

Image Noise

Sensor Noise before Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
20	1000
31	2000
45	4000
57	6000
68	8000
78	10000
85	12000
87	12500

Sensor Noise after Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
21	1000
28	2000
41	4000
51	6000
58	8000
65	10000
72	12000
78	14000
83	15500

Radiometric Calibration

Aperture Correction

MS2 (Blue) (00122306)

The light fall off to the border due the influence of the optics depends on the aperture used. Therefore this calibration approach delivers individual calibration images for each aperture (Full F-Stop). In general the light fall off is a function of the image height (radial distance from center).
The tables below shows the values from the upper left corner to the lower right corner of the calibration images.

MS2 (Blue) DMC II 250 – 040

Relative Grayvalue (Normalized to max) F11	Radius [mm]
0.55 0.78 0.92 0.98 0.92 0.89 0.52	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F16	Radius [mm]
0.51 0.78 0.92 0.98 0.92 0.89 0.52	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F22	Radius [mm]

0.51 0.78 0.92 0.98 0.92 0.89 0.50	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F2.8	Radius [mm]
0.47 0.78 0.92 0.98 0.92 0.89 0.47	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F4	Radius [mm]
0.51 0.78 0.92 0.98 0.92 0.89 0.52	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F5.6	Radius [mm]
0.51 0.78 0.92 0.98 0.92 0.89 0.52	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F8	Radius [mm]
0.55 0.78 0.92 0.98 0.92 0.89 0.52	-33 -20 -10 0 10 20 33

This is a camera type specific calibration.

Radiometric Calibration

Defect Pixel

MS2 (Blue) (00122306)

Defect pixels are detected during radiometric calibration and will be corrected during radiometric processing of the images. The quantity and cumulative percentage and specification of defects is described in Appendix “Defect Pixel Recognition”.

Revision of calibration: 65537
CCDRevision: 1
Date Number: 1352899170
Date: 140131

Number of defect pixels: 2
Number of defect clusters: 0
Number of defect columns: 0

Row	Column
1060	4094
1061	4094

This is a camera type specific calibration.

Optical System

Modulation Transfer Function, MTF of MS1 (NIR)

DMC II 250 – 040 MS1 (NIR)-MTF Polychromatic F/4.0; 45 [mm]-Temperature Stability

Modulation Transfer Function	Temperature
0.0	0.0

Radiometric Calibration

Sensitivity of MS1 (NIR)

Spectral response curve of the single camera head.

DMC II 250 – 040 Relative Spectral Response

Relative Spectral Response	Wavelength [nm]
0.0	350
0.0	950
0.0	680
0.0	900
0.1	690
0.1	895
0.2	695
0.2	860
0.4	700
0.4	835
0.6	710
0.6	790
0.8	715
0.8	760
1.0	735

The sensitivity shows the spectral response curve of the single camera head including the optical system (optics, filter) and the sensor response. The DMC II 250 is calibrated with respect to the absolute spectrometer. This allows computing pixel radiance values from pixels digital numbers and is a camera type specific calibration.

Radiometric Calibration

Sensor Linearity (Reference)

The sensor linearity is measured in the Lab with calibrated spectrometer. This is a camera type specific calibration.

Below table shows the linearity of the raw sensor and after flat fielding:

Linearity

Intermediate

Grayvalue	Light (100= Saturated)
0	0
3000	20
6500	40
9500	60
13000	80
14500	90

Raw

Grayvalue	Light (100= Saturated)
500	0
3500	20
7000	40
10500	60
13500	80
15000	90

Senor Linearity from Light Level 0 (dark) to (100 % = Saturation)

The deviation from the linearity is below 1%.

Radiometric Calibration

Sensor Noise (Reference)

Sensor noise shows image noise with respect to the image center measured at an aperture of 8 with exposure time of 22msec. Sensor noise after calibration shall be less or equal 0.5% of radiometric resolution. At 14bit radiometric resolution 0.5% (of 16384) is equal to 82 gray values. This is a camera type specific calibration.

Image Noise

Sensor Noise before Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
20	1000
31	2000
45	4000
57	6000
68	8000
78	10000
85	12000
87	12500

Sensor Noise after Normalization

Noise [Grayvalue]	Image Brightness [Grayvalue]
21	1000
28	2000
41	4000
51	6000
58	8000
65	10000
72	12000
78	14000
83	15500

Radiometric Calibration

Aperture Correction

MS1 (NIR) (00118794)

The light fall off to the border due the influence of the optics depends on the aperture used. Therefore this calibration approach delivers individual calibration images for each aperture (Full F-Stop). In general the light fall off is a function of the image height (radial distance from center).
The tables below shows the values from the upper left corner to the lower right corner of the calibration images.

MS1 (NIR) DMC II 250 – 040

Relative Grayvalue (Normalized to max) F11	Radius [mm]
0.53 0.75 0.90 0.98 0.92 0.77 0.53	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F16	Radius [mm]
0.53 0.75 0.90 0.98 0.92 0.77 0.53	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F22	Radius [mm]

0.53 0.75 0.90 0.98 0.92 0.77 0.53	0 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F2.8	Radius [mm]
0.45 0.74 0.90 0.98 0.92 0.77 0.48	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F4	Radius [mm]
0.53 0.75 0.90 0.98 0.92 0.77 0.53	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F5.6	Radius [mm]
0.53 0.75 0.90 0.98 0.92 0.77 0.53	-33 -20 -10 0 10 20 33

Relative Grayvalue (Normalized to max) F8	Radius [mm]
0.53 0.75 0.90 0.98 0.92 0.77 0.53	-33 -20 -10 0 10 20 33

This is a camera type specific calibration.

Radiometric Calibration

Defect Pixel

MS1 (NIR) (00118794)

Defect pixels are detected during radiometric calibration and will be corrected during radiometric processing of the images. The quantity and cumulative percentage and specification of defects is described in Appendix “Defect Pixel Recognition”.

Revision of calibration: 65537
CCDRevision: 1
Date Number: 1352372035
Date: 140131

Number of defect pixels: 7
Number of defect clusters: 0
Number of defect columns: 0

Row	Column
5209	286
4110	1290
4111	1290
4127	1293
4128	1293
6664	2782
1991	5688

This is a camera type specific calibration.

Sensor Geometric Accuracy

Large area CCD imagers are composed (stitched) from several blocks. Stitching on wafer with semiconductor lithographic equipment results in geometric accuracy better than 0.1m (Stoldt, H. (2010). Therefore the geometric accuracy of individual pixels within a block can be assumed as better or equal the stitching accuracy.

Defect Pixel Recognition

The table below shows the maximal allowed physical defects on the CCD Sensor and its definitions.

Description		CCD Spec
Pixel	Bright image	Pixel whose signal, at nominal light (illumination at 50% of the linear range), deviates more than 30% from its neighboring pixels.
	Dark image	Pixel whose signal, in dark, deviates more than 6mV from its neighboring pixels (about 1% of nominal light).
	Max Count PAN	3500
	Max Count MS	500

Description		CCD Spec
Column	Definition	A column which has more than 8 pixel defects in 1 1x 12 kernel Column defects must be horizontally separated by 5 columns for single line defects and 10 for double line defects
	Recognition (bright and dark)	Same as defect pixel recognition
	Max single column PAN	140
	Max single column MS	20
	Max double column PAN	40
	Max double column MS	6

The Post-Processing-Software is correcting following pixel and columns:

PPS Correction	
Pixel	Pixel whose gray value in a 16 x16 kernel differs from the median more than 30%

PPS Correction	
Column	Pixel whose gray value in a 16 x16 kernel differs from the median more than 5% and more than 15 defects in one column

Bibliography

Brown D. C. Close-Range Camera Calibration, Photogrammetric Engineering 37(8) 1971

Dörstel C., Jacobsen K., Stallmann D. (2003): DMC – Photogrammetric accuracy – Calibration aspects and Generation of synthetic DMC images, Eds. M. Baltsavias / A.Grün, Optical 3D Sensor Workshop, Zürich

Fraser C., Digital Camera sel-f calibration. ISPRS Journal of Photogrammetry and Remote Sensing, (997, 5284): 149-159

Zeitler W., Dörstel C., Jacobsen K. (2002): Geometric calibration of the DMC: Method and Results, Proceedings ASPRS, Denver, USA.

Ryan R., Pagnutti M. (2009): Enhanced Absolute and Relative Radiometric Calibration for Digital Aerial Cameras, in: Fritsch D. (Ed.), Photogrammetric Week 2009, Wichmann-Verlag, pp. 81-90.

Doering D., Hildebrand J., Diete N. (2009): Advantages of customized optical design for aerial survey cameras, in: Fritsch D. (Ed.), Photogrammetric Week 2009, Wichmann-Verlag, pp. 69-80.

Stoldt, H. (2010): DALSA Ultra large CCD technology Customized for Aerial Photogrammetry. At: ASPRS 2010, San Diego, USA, p. 15.