Airborne Science Mission Metadata XML Implementation Rules

Version 1.0b

The Airborne Science Mission Metadata (ASMM) standard is intended to unify descriptions of science research flights. This common description will allow users of the airborne science data to search past datasets for specific meteorological conditions, geographical regions, cloud-types encountered, particles sampled, and other parameters not evident from the data itself. Within the ASMM standard, we do not define a standard for creation of this metadata, only a standard for storing and sharing this metadata. For this, the XML format has been chosen.

This document defines the XML implementation rules for the ASMM standard. For each parameter, a table is used to describe the basic elements including:

- XML Name – name of the element in the XML file
- XPath – relative location of the metadata element within the XML file
- Data Type – type of data contained in the metadata element
- Multiplicity – allowed instances of the given element
- Example – brief example illustrating element usage

In cases where the XML element stores no metadata itself (i.e. for parent objects), the Data Type and Example fields are left blank.

Methods used to generate ASMM XML files are not constrained, however a free ASMM metadata creation tool has been developed to aid adoption of this standard, and will allow deployment among the various operators in a common fashion. This tool will provides users with a graphical user interface (GUI) with the relevant fields and generates an ASMM XML file using the parameters entered into the GUI by the user. The ASMM Creator can be used as an online application, accessible from http://asmm.eufar.net/, and as an offline application, to be downloaded from https://github.com/eufarn7sp/asmm-eufar/releases.

1 Namespace Definition

To differentiate the metadata fields used in the Airborne Science Mission Metadata XML standard from other XML fields, the following namespace is defined:

Namespace prefix: asmm

Namespace name: http://www.eufar.net/ASMM

Thus the metadata in an ASMM XML file will begin and end with:

```
<asmm:MissionMetadata xmlns:asmm="http://www.eufar.net/ASMM">
…
</asmm:MissionMetadata>
```

2 XML Mapping

2.1 Creation Date

XML Name	**CreationDate**
XPath	/MissionMetadata/CreationDate
Data Type	ISO 8601 Date
Multiplicity	[1]
Example	2011-01-28

2.2 Revision Date

XML Name	**RevisionDate**
XPath	/MissionMetadata/RevisionDate
Data Type	ISO 8601 Date
Multiplicity	[1]
Example	2011-02-03

2.3 General Header Metadata

XML Name	**FlightInformation**

XPath	/MissionMetadata/FlightInformation
Data Type	
Multiplicity	[1]
Example	

2.3.1 Flight Number

XML Name	**FlightNumber**
XPath	/MissionMetadata/FlightInformation/FlightNumber
Data Type	Text
Multiplicity	[1]
Example	B561

2.3.2 Date

XML Name	**Date**
XPath	/MissionMetadata/FlightInformation/Date
Data Type	ISO 8601 date
Multiplicity	[1]
Example	2011-01-28

2.3.3 Campaign

XML Name	**Campaign**
XPath	/MissionMetadata/FlightInformation/Campaign
Data Type	Text
Multiplicity	[1]
Example	COALESC

2.3.4 Mission Scientist

XML Name	**MissionScientist**
XPath	/MissionMetadata/FlightInformation/MissionScientist
Data Type	Text
Multiplicity	[1]
Example	Joe Scientist

2.3.5 Flight Manager

XML Name	**FlightManager**
XPath	/MissionMetadata/FlightInformation/FlightManager
Data Type	Text
Multiplicity	[1]
Example	Ann Other

2.3.6 Platform/Aircraft

XML Name	**Platform**
XPath	/MissionMetadata/FlightInformation/Platform
Data Type	Text
Multiplicity	[1]
Example	BAe146-301

2.3.7 Operator

XML Name	**Operator**
XPath	/MissionMetadata/FlightInformation/Operator
Data Type	Text
Multiplicity	[1]
Example	FAAM

2.3.8 Operator Country

XML Name	**Operator Country**
XPath	/MissionMetadata/FlightInformation/OperatorCountry
Data Type	ISO 3166-1 Text
Multiplicity	[1]
Example	United Kingdom

2.3.9 Manufacturer

XML Name	**Manufacturer**
XPath	/MissionMetadata/FlightInformation/Manufacturer
Data Type	Text
Multiplicity	[1]
Example	BAE Systems

2.3.10 Registration Number

XML Name	**Registration Number**
XPath	/MissionMetadata/FlightInformation/RegistrationNumber
Data Type	Text
Multiplicity	[1]
Example	G-LUXE

2.3.11 Country

XML Name	**Country**
XPath	/MissionMetadata/FlightInformation/Country
Data Type	ISO 3166-1 Text
Multiplicity	[1]

Example	UK

2.4 Metadata Contact Information

XML Name	**ContactInfo**
XPath	/MissionMetadata/ContactInfo
Data Type	
Multiplicity	[1]
Example	

2.4.1 Name

XML Name	**ContactName**
XPath	/MissionMetadata/ContactInfo/ContactName
Data Type	Text
Multiplicity	[1]
Example	Joe Scientist

2.4.2 Role

XML Name	**ContactRole**
XPath	/MissionMetadata/ContactInfo/ContactRole
Data Type	Text
Multiplicity	[1]
Example	Mission Scientist

2.4.3 E-mail

XML Name	**ContactEmail**
XPath	/MissionMetadata/ContactInfo/ContactEmail
Data Type	Email address text
Multiplicity	[1]
Example	jscientist@email.com

2.5 Main Scientific Aims

XML Name	**ScientificAims**
XPath	/MissionMetadata/ScientificAims
Data Type	
Multiplicity	[1]
Example	

2.5.1 Scientific Aims Code

XML Name	**SA_Code**
XPath	/MissionMetadata/ScientificAims/SA_Code
Data Type	Scientific aims code (see list below for options)
Multiplicity	[0..*]
Example	Satellite Cal/Val

XML Code Options:

Parameter Name	XML Code
• Satellite Cal/Val	Satellite Cal/Val
• Aerosol:	Aerosol
○ Radiative properties / impacts	Radiative properties/impacts (Aerosol)
○ Cloud microphysical impacts	Cloud microphysical impacts (Aerosol)
• Anthropogenic pollution	Anthropogenic pollution
• Mesoscale atmospheric impacts	Mesoscale atmospheric impacts
• Cloud:	
○ Microphysics	Microphysics (Cloud)
○ Dynamics	Dynamics (Cloud)
○ Radiative properties	Radiative properties (Cloud)
○ Convection dynamics	Convection dynamics (Cloud)
• Boundary-layer	
○ Cloud	Cloud (Boundary-layer)
○ Dynamics	Dynamics (Boundary-layer)
• Radiation	Radiation
○ Atmospheric spectroscopy	Atmospheric spectroscopy (Radiation)
○ Surface properties / retrievals	Surface properties/retrievals (Radiation)
○ Other	Other (Radiation)
• Gas Chemistry	Gas chemistry
○ Oxidants	Oxydants (Gas chemistry)
○ Organics	Organics (Gas chemistry)
○ Other	Other (Gas chemistry)

2.5.2 Scientific Aims User Code

XML Name	**SA_User**
XPath	/MissionMetadata/ScientificAims/SA_User
Data Type	Scientific aims code defined by a user
Multiplicity	[0..*]
Example	Global sea level

2.5.3 Scientific Aims Comments

XML Name	**SA_Other**
XPath	/MissionMetadata/ScientificAims/SA_Other
Data Type	Text
Multiplicity	[0..1]
Example	This is a set of sample notes.

2.6 Geographical Region

XML Name	**GeographicalRegion**
XPath	/MissionMetadata/GeographicalRegion
Data Type	
Multiplicity	[1]
Example	

2.6.1 Geographic Bounding Box

XML Name	**GeographicBoundingBox**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox
Data Type	
Multiplicity	[1]
Example	

2.6.1.1 West Bound Longitude

XML Name	**westBoundLongitude**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox/westBoundLongitude
Data Type	Decimal [degrees]
Multiplicity	[1]
Example	3.93

2.6.1.2 East Bound Longitude

XML Name	**eastBoundLongitude**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox/eastBoundLongitude
Data Type	Decimal [degrees]
Multiplicity	[1]
Example	7.57

2.6.1.3 North Bound Latitude

XML Name	**northBoundLatitude**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox/northBoundLatitude

Data Type	Decimal [degrees]
Multiplicity	[1]
Example	54.10

2.6.1.4 South Bound Latitude

XML Name	**southBoundLatitude**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox/southBoundLatitude
Data Type	Decimal [degrees]
Multiplicity	[1]
Example	52.10

2.6.1.5 Minimum Altitude

XML Name	**minAltitude**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox/minAltitude
Data Type	Decimal [meters]
Multiplicity	[1]
Example	1695.49

2.6.1.6 Maximum Altitude

XML Name	**maxAltitude**
XPath	/MissionMetadata/FlightInformation/GeographicBoundingBox/maxAltitude
Data Type	Decimal [meters]
Multiplicity	[1]
Example	5185.39

2.6.2 Geographical Region Code

XML Name	**GR_Code**
XPath	/MissionMetadata/GeographicalRegion/GR_Code
Data Type	Geographical region code (see list below for options)
Multiplicity	[0..*]
Example	Sub-tropical

XML Code Options:

Parameter Name	XML Code
• Polar	Polar
• Mid-latitudes	Mid-latitudes
• Sub-tropical	Sub-tropical
• Tropical	Tropical
• Maritime	Maritime

• Continental	Continental
• Oceanic Islands	Oceanic islands
• Other	Other (Geographical region)"

2.6.3 Geographical Region User Code

XML Name	**GR_User**
XPath	/MissionMetadata/GeographicalRegion/GR_User
Data Type	Geographical region code defined by a user
Multiplicity	[0..*]
Example	Sub-equatorial

2.6.4 Geographical Region Comments

XML Name	**GR_Other**
XPath	/MissionMetadata/GeographicalRegion/GR_Other
Data Type	Text
Multiplicity	[0..1]
Example	Sub-tropical – I wish!

2.7 Atmospheric synoptic features

XML Name	**AtmosFeatures**
XPath	/MissionMetadata/AtmosFeatures
Data Type	
Multiplicity	[1]
Example	

2.7.1 Atmospheric Synoptic Features Code

XML Name	**AF_Code**
XPath	/MissionMetadata/AtmosFeatures/AF_Code
Data Type	Atmospheric features code (see list below for options)
Multiplicity	[0..*]
Example	Stationary anticyclonic

XML Code Options

Parameter Name	XML Code
• Stationary	Stationary
◦ anticyclonic	Stationary anticyclonic
◦ cyclonic	Stationary cyclonic

• Warm front	Warm front
• Warm conveyor belt	Warm conveyor belt
• Cold front	Cold front
• Occluded front	Occluded front
• Warm sector	Warm sector
• Post-cold-frontal air-mass	Post-cold-frontal air-mass
• Arctic cold-air outbreak	Arctic cold-air outbreak
• Orographic influence	Orographic influence
• Sea-breeze front	Sea-breeze front
• Stratospheric fold/intrusion	Stratospheric fold/intrusion
• Extended convergence line (mesoscale to ITCZ)	Extended convergence line
• Easterly wave	Easterly wave
• Equatorial wave (active or suppressed)	Equatorial wave
• Tropical cyclone or extra-tropical transition	Tropical cyclone
• Mesoscale organized convection	Mesoscale organized convection

2.7.2 Atmospheric Synoptic Features User Code

XML Name	**AF_User**
XPath	/MissionMetadata/AtmosFeatures/AF_User
Data Type	Atmospheric features code defined by a user
Multiplicity	[0..*]
Example	stationaryAnticyclonic

2.7.3 Atmospheric Synoptic Features Comments

XML Name	**AF_Other**
XPath	/MissionMetadata/AtmosFeatures/AF_Other
Data Type	Text
Multiplicity	[0..1]
Example	

2.8 Cloud types and forms sampled during flight

XML Name	**CloudTypes**
XPath	/MissionMetadata/CloudTypes
Data Type	

Multiplicity	[1]
Example	

2.8.1 Cloud Types Code

XML Name	**CT_Code**
XPath	/MissionMetadata/CloudTypes/CT_Code
Data Type	Cloud types code (see list below for options)
Multiplicity	[0..*]
Example	Cloud-free below aircraft

XML Code Options:

Parameter Name	XML Code
• Water clouds	Water clouds
• Mixed-phase clouds	Mixed-phase clouds
• Ice clouds	Ice clouds
• Cirrus	Cirrus
• Contrails	Contrails
• Stratocumulus	Stratocumulus
• Shallow cumulus	Shallow cumulus
• Cumulus congestus	Cumulus congestus
• Cumulonimbus / towering cumulus	Cumulonimbus/towering cumulus
• Altostratus / altocumulus	Altostratus/altocumulus
• Wave clouds	Wave clouds
• Deep frontal stratiform clouds	Deep frontal stratiform clouds
• Cloud-free above aircraft	Cloud-free above aircraft
• Cloud-free below aircraft	Cloud-free below aircraft

2.8.2 Cloud Types User Code

XML Name	**CT_User**
XPath	/MissionMetadata/CloudTypes/CT_User
Data Type	Cloud types code defined by a user
Multiplicity	[0..*]
Example	Popcorn cloud

2.8.3 Cloud Types Comments

XML Name	**CT_Other**
XPath	/MissionMetadata/CloudTypes/CT_Other
Data Type	Text
Multiplicity	[0..1]

Example	The most amazing cloud-free day I ever saw.

2.9 Cloud, precipitation and aerosol particles sampled during flight

XML Name	**ParticlesSampled**
XPath	/MissionMetadata/ParticlesSampled
Data Type	
Multiplicity	[0..1]
Example	

2.9.1 Particles Sampled Code

XML Name	**PS_Code**
XPath	/MissionMetadata/ParticlesSampled/PS_Code
Data Type	Particles sampled code (see list below for options)
Multiplicity	[0..*]
Example	Sea-salt aerosol

XML Code Options:

Parameter Name	XML Code
• Rain	Rain
• Drizzle	Drizzle
• Droplets (liquid)	Droplets (Liquid)
• Pristine ice crystals	Pristine ice crystals
• Snow / aggregates	Snow/aggregates
• Graupel / hail	Graupel/hail
• Sea-salt aerosol	Sea-salt aerosol
• Continental aerosol	Continental aerosol
• Urban plume	Urban plume
• Biomass burning	Biomass burning
• Desert / mineral dust	Desert/mineral dust
• Volcanic ash	Volcanic ash

2.9.2 Particles Sampled User Code

XML Name	**PS_User**
XPath	/MissionMetadata/ParticlesSampled/PS_User
Data Type	Particles sampled code defined by a user
Multiplicity	[0..*]

Example	Stratospheric aerosol

2.9.3 Particles Sampled Comments

XML Name	**PS_Other**
XPath	/MissionMetadata/ParticlesSampled/PS_Other
Data Type	Text
Multiplicity	[0..1]
Example	Probably sea-salt encountered at the base of profile descents over the sea.

2.10 Land or ocean surfaces overflown

XML Name	**SurfacesOverflown**
XPath	/MissionMetadata/SurfacesOverflown
Data Type	
Multiplicity	[1]
Example	

2.10.1 Surfaces Overflown Code

XML Name	**SO_Code**
XPath	/MissionMetadata/SurfacesOverflown/SO_Code
Data Type	Surfaces overflown code (see list below for options)
Multiplicity	[0..*]
Example	Ocean

XML Code Options:

Parameter Name	XML Code
• Ocean	Ccean
• Semi-arid	Semi-arid
• Sea-ice	Sea-ice
• Desert	Desert
• Snow	Snow
• Urban	Urban
• Lake-ice	Lake-ice
• Mountainous	Mountainous
• Vegetation	Vegetation
• Hilly	Hilly
• Forest	Forest
• Flat	Flat

2.10.2 Surfaces Overflown User Code

XML Name	**SO_User**
XPath	/MissionMetadata/SurfacesOverflown/SO_User
Data Type	Surfaces overflown code defined by a user
Multiplicity	[0..*]
Example	Lava lake

2.10.3 Surfaces Overflown Comments

XML Name	**SO_Other**
XPath	/MissionMetadata/SurfacesOverflown/SO_Other
Data Type	Text
Multiplicity	[0..1]
Example	

2.11 Altitude ranges of measurement

XML Name	**AltitudeRanges**
XPath	/MissionMetadata/AltitudeRanges
Data Type	
Multiplicity	[1]
Example	

2.11.1 Altitude Ranges Code

XML Name	**AR_Code**
XPath	/MissionMetadata/AltitudeRanges/AR_Code
Data Type	Altitude ranges code (see list below for options)
Multiplicity	[0..*]
Example	Near-surface (Boundary-layer), Sub-cloud (Boundary-layer), Lower troposphere, Upper troposphere, Mid troposphere

XML Code Options:

Parameter Name	XML Code
• Boundary-layer	Boundary-layer
◦ near-surface	Near-surface (Boundary-layer)
◦ sub-cloud	Sub-cloud (Boundary-layer)
◦ in-cloud	In-cloud (Boundary-layer)
• Lower troposphere	Lower troposphere

• Mid troposphere	Mid troposphere
• Upper troposphere	Upper troposphere
• Lower stratosphere	"Lower stratosphere

2.11.2 Altitude Ranges User Code

XML Name	**AR_User**
XPath	/MissionMetadata/AltitudeRanges/AR_User
Data Type	Altitude ranges code defined by a user
Multiplicity	[0..*]
Example	High stratosphere

2.11.3 Altitude Ranges Comments

XML Name	**AR_Other**
XPath	/MissionMetadata/AltitudeRanges/AR_Other
Data Type	Text
Multiplicity	[0..1]
Example	

2.12 Types of flight manoeuvre

XML Name	**FlightTypes**
XPath	/MissionMetadata/FlightTypes
Data Type	
Multiplicity	[1]
Example	

2.12.1 Flight Types Code

XML Name	**FT_Code**
XPath	/MissionMetadata/FlightTypes/FT_Code
Data Type	Flight type code (see list below for options
Multiplicity	[0..*]
Example	Stacked (Straight/level runs)

XML Code Options:

Parameter Name	XML Code
• Straight/level runs	Straight/level runs

○ stacked	Stacked (Straight/level runs)
○ separated	Separated (Straight/level runs)
• Racetracks	Racetracks
• Orbits	Orbits
• Lagrangian descents	Lagrangian descents
• Deep profile ascents / descents (to/from min altitude)	Deep profile ascents/descents
• Dropsonde deployed	Dropsonde deployed
• Self-calibration	Self-calibration

2.12.2 Flight Types User Code

XML Name	**FT_User**
XPath	/MissionMetadata/FlightTypes/FT_User
Data Type	Flight type code define by a user
Multiplicity	[0..*]
Example	Hold

2.12.3 Flight Types Comments

XML Name	**FT_Other**
XPath	/MissionMetadata/FlightTypes/FT_Other
Data Type	Text
Multiplicity	[0..1]
Example	Two sets of runs flown at different locations.

2.13 Satellite coordination

XML Name	**SatelliteCoordination**
XPath	/MissionMetadata/SatelliteCoordination
Data Type	
Multiplicity	[0..1]
Example	

2.13.1 Satellite Coordination Code

XML Name	**SC_Code**
XPath	/MissionMetadata/SatelliteCoordination/SC_Code
Data Type	Satellite coordination code (see list below for options)
Multiplicity	[0..*]
Example	METOP (Polar)

XML Code Options:

Parameter Name	XML Code
• Polar:	
◦ METOP	METOP (Polar)
◦ NPOESS	NPOESS (Polar)
◦ A-train	A-train (Polar)
◦ Other	Other (Polar)
• Geosynch	
◦ MSG	MSG (Geosynch)
◦ Other	Other (Geosynch)
• MODIS	MODIS
• Cloudsat	Cloudsat
• CALIOP	CALIOP
• IASI	IASI
• AIRS	AIRS
• CriS	CriS
• AMSU/MHS	AMSU/MHS

2.13.2 Satellite Coordination User Code

XML Name	**SC_User**
XPath	/MissionMetadata/SatelliteCoordination/SC_User
Data Type	Satellite coordination code defined by a user
Multiplicity	[0..*]
Example	Jason-1

2.13.3 Satellite Coordination Comments

XML Name	**SC_Other**
XPath	/MissionMetadata/SatelliteCoordination/SC_Other
Data Type	Text
Multiplicity	[0..1]
Example	Classed as a Golden Day.

2.14 Supporting surface-based observations

XML Name	**SurfaceObs**
XPath	/MissionMetadata/SurfaceObs
Data Type	
Multiplicity	[0..1]

Example	

2.14.1 Research vessel

XML Name	**ResearchVessel**
XPath	/MissionMetadata/SurfaceObs/ResearchVessel
Data Type	Text
Multiplicity	[0..*]
Example	R.V. Imadeitup

2.14.2 Ground site

XML Name	**GroudSite**
XPath	/MissionMetadata/SurfaceObs/GroundSite
Data Type	Text
Multiplicity	[0..*]
Example	Chilbolton

2.14.3 ARM site

XML Name	**ArmSite**
XPath	/MissionMetadata/SurfaceObs/ArmSite
Data Type	Text
Multiplicity	[0..*]
Example	

2.14.4 ARM mobile

XML Name	**ArmMobile**
XPath	/MissionMetadata/SurfaceObs/ArmMobile
Data Type	Text
Multiplicity	[0..*]
Example	

2.15 Additional notes on the flight

XML Name	**OtherComments**
XPath	/MissionMetadata/OtherComments
Data Type	Text
Multiplicity	[0..1]
Example	These are my additional notes that explain what a wonderful and productive flight this was.

3 Example Mission Science Metadata XML

```
<?xml version="1.0" encoding="UTF-8"?>
<asmm:MissionMetadata xmlns:asmm="http://www.eufar.net/ASMM">
      <asmm:CreationDate>2011-01-28</asmm:CreationDate>
      <asmm:RevisionDate>2011-02-03</asmm:RevisionDate>
      <asmm:FlightInformation>
            <asmm:FlightNumber>B561</asmm:FlightNumber>
            <asmm:Date>2011-01-28</asmm:Date>
            <asmm:Campaign>COALESC</asmm:Campaign>
            <asmm:MissionScientist>Joe Scientist</asmm:MissionScientist>
            <asmm:FlightManager>Ann Other</asmm:FlightManager>
            <asmm:Platform>BAe146-301</asmm:Platform>
            <asmm:Operator>FAAM</asmm:Operator>
            <asmm:OperatorCountry>United Kingdom</asmm:OperatorCountry>
            <asmm:Manufacturer>BAE Systems</asmm:Manufacturer>
            <asmm:RegistrationNumber>G-LUXE</asmm:RegistrationNumber>
            <asmm:Country>Germany</asmm:Country>
      </asmm:FlightInformation>
      <asmm:ContactInfo>
            <asmm:ContactName>Joe Scientist</asmm:ContactName>
            <asmm:ContactRole>Mission Scientist</asmm:ContactRole>
            <asmm:ContactEmail>jscientist@email.com</asmm:ContactEmail>
      </asmm:ContactInfo>
      <asmm:ScientificAims>
            <asmm:SA_Code>Satellite Cal/Val</asmm:SA_Code>
            <asmm:SA_User>Global sea level</asmm:SA_User>
            <asmm:SA_Other>This is a set of sample notes</asmm:SA_Other>
      </asmm:ScientificAims>
      <asmm:GeographicalRegion>
            <asmm:GeographicBoundingBox>
                  <asmm:westBoundLongitude>3.93</asmm:westBoundLongitude>
                  <asmm:eastBoundLongitude>7.57</asmm:eastBoundLongitude>
                  <asmm:northBoundLatitude>54.10</asmm:northBoundLatitude>
                  <asmm:southBoundLatitude>52.10</asmm:southBoundLatitude>
                  <asmm:minAltitude>1695.49</asmm:minAltitude>
                  <asmm:maxAlitutde>5185.39</asmm:maxAltitude>
            <asmm:GR_Code>Sub-tropical</asmm:GR_Code>
```

```
      <asmm:GR_User>Sub-equatorial</asmm:GR_User>
      <asmm:GR_Other>Sub-tropical - I wish!</asmm:GR_Other>
</asmm:GeographicalRegion>
<asmm:AtmosFeatures>
      <asmm:AF_Code>Stationary anticyclonic</asmm:AF_Code>
</asmm:AtmosFeatures>
<asmm:CloudTypes>
      <asmm:CT_Code>Cloud-free above aircraft</asmm:CT_Code>
      <asmm:CT_Code>Cloud-free below aircraft</asmm:CT_Code>
      <asmm:CT_Other>The most amazing cloud-free day I ever
saw.</asmm:CT_Other>
</asmm:CloudTypes>
<asmm:ParticlesSampled>
      <asmm:PS_Code>Sea-salt aerosol</asmm:PS_Code>
      <asmm:PS_Other>Probably sea-salt encountered at the base of
profile descents over the sea.</asmm:PS_Other>
</asmm:ParticlesSampled>
<asmm:SurfacesOverflown>
      <asmm:SO_Code>Ocean</asmm:SO_Code>
</asmm:SurfacesOverflown>
<asmm:AltitudeRanges>
      <asmm:AR_Code>Near-surface (Boundary-layer)</asmm:AR_Code>
      <asmm:AR_Code>Sub-cloud (Boundary-layer)</asmm:AR_Code>
      <asmm:AR_Code>Lower troposphere</asmm:AR_Code>
      <asmm:AR_Code>Upper troposphere</asmm:AR_Code>
      <asmm:AR_Code>Mid troposphere</asmm:AR_Code>
</asmm:AltitudeRanges>
<asmm:FlightTypes>
      <asmm:FT_Code>Stacked (Straight/level runs)</asmm:FT_Code>
      <asmm:FT_Other>Two sets of runs flown at different
locations</asmm:FT_Other>
</asmm:FlightTypes>
<asmm:SatelliteCoordination>
      <asmm:SC_Code>METOP (Polar)</asmm:SC_Code>
      <asmm:SC_Other>Classed as a Golden Day.</asmm:SC_Other>
</asmm:SatelliteCoordination>
<asmm:SurfaceObs>
      <asmm:ResearchVessel>R.V. Imadeitup</asmm:ResearchVessel>
      <asmm:GroundSite>Chilbolton</asmm:GroundSite>
</asmm:SurfaceObs>
```

```
      <asmm:OtherComments>These are my additional notes that explain what a
wonderful and productive flight this was.</asmm:OtherComments>

</asmm:MissionMetadata>
```