MERIS Sentinel3-like L1 and L2 Product Format Specification

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Signatures

	Name	Company	Signature
Prepared by	Julien Demaria	ACRI-ST	
Verified by	Ludovic Bourg	ACRI-ST	

Distribution list

Company	To
ESA	Philippe Goryl

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Table Of Content

List Of Figures

List Of Tables

1 INTRODUCTION

1.1 Purpose and Scope

This document specifies the format of the Envisat/MERIS Level 1 and Level 2 products applicable to the 4th data reprocessing. The Envisat data format (.N1) used up to the 3rd MERIS data reprocessing is given up in favour of a Sentinel-3 like format based on a folder of netCDF data files complemented by an xml Manifest file describing the package.

1.2 Structure of the Document

In addition to this introduction, the document is divided into a number of major sections that are briefly described below:

Table 1-1: Document Structure

Chapter	Title	Content
1	INTRODUCTION	This section.
2	OVERVIEW OF THE MERIS INSTRUMENT	A description of the main features and characteristics of the MERIS instrument is provided here.
3	PRODUCT OVERVIEW	The Product Tree for MERIS instruments and the product names convention are specified here.
4	MERIS PRODUCT FORMAT	In this section the format of each MERIS Product, from Level 1 up to Level 2 is specified. NetCDF Data Files of each product are reported in this section.
5	MANIFEST FILE	In this section details for the implementation of the manifest file is provided.
6	XML SCHEMAS	In this section details of the schemas used to generate the manifest is provided.
7	PRODUCT SIZE	In this section the size of each file composing the MERIS products is provided.

1.3 Applicable and Reference Documents

1.3.1 Applicable documents

The following table lists the documents with a direct bearing on the content of this document.

ID	Document	Reference
AD- 1	Sentinel 3 PDGS File Naming Convention	EUM/LEO-SEN3/SPE/10/0070 GMES-S3GS-EOPG-TN-09-0009, Issue 1.3, 07/11/2012

ID	Document	Reference
AD- 2	Product Data Format Specification - Product Structures	S3IPF.PDS.002, i1r6, 10/02/2015
AD- 3	Drivers for the S3 PDGS Processing Function Implementation	EUM/LEO-SEN3/TEN/09/0183, V1G, ESA:GMES-GSEG-EOPG-TN-11-0062 , i1r7, 27/06/2014
AD- 4	Metadata Specification, Excel document	S3IPF.PDS.008, i3r0.6 *This reference is the baseline document describing the primary and secondary metadata of the product manifests. As soon as this document is consolidated, the tables will be fully included in the present document.*
AD- 5	XML Schemas.zip – Zip file containing all the schemas used to represent the metadata	S3IPF PDS 009, i2r5 – 26/03/2015
AD- 6	Sentinel SAFE Control Book Volume 1 – Core Specifications	GAEL-P264-DOC-0001-01-01, i1r1, 05/06/2012
AD- 7	Auxiliary Data Format Specification	S3IPF.PDS.007, i2r2 20/05/2016
MAD- 1	Guidelines for the specification of ground processing algorithms	PO-RS-ESA-GS-0252
MAD- 2	ENVISAT-1 Product Format Guidelines	PO-TN-ESA-GS-0242
MAD- 3	ENVISAT-1 Product Definition	PO-TN-ESA-GS-0231
MAD- 4	ENVISAT-1 Product Specifications	PO-RS-MDA-GS-2009
MAD- 5	PGICD Vol. 7: Measurement Data Definition and Format Description for MERIS	PO-ID-DOR-SY-0032
MAD- 6	Neural Net Interface Document	PO-TN-MEL-GS-0025

1.3.2 Reference documents

The following reference documents contain information supporting this document.

ID	Document	Reference
RD- 1	CCSDS 661.0-B-0 XFDU structure and construction rules	Issue Sept. 2008
RD- 2	Product Data Format Specification - Level 0	S3IPF.PDS.001, i1r7, 10/02/2015
RD- 3	Sentinel 3 Level 0, Level 1a/b/c Products Definition Part 2: Optical Products. Volume 1: Introduction, Conventions, and Common Structures (SY-4)	S3-RS-ACR-SY-00001, i8r0, 30/01/2015
RD- 4	Sentinel-3 Level 0, Level 1a/b/c Products Definition Part 2: Optical Products Volume 2: OLCI L0, L1b Products (SY-4)	S3-RS-ACR-SY-00004, i8r1, 17/04/2015
RD- 5	Sentinel-3 Optical products and Algorithm Definition: OLCI Product Definition	S3-L2-SD-05-C-ACR-PD, i2r5A, 25/09/2012

ID	Document	Reference
RD- 6	Sentinel-3 Optical products and Algorithm Definition: OLCI Level 2 Input Output Data Description	S3-L2-SD-08-C-ACR-IODD, i2r11.A, 07/02/2014
MRD- 1	ENVISAT-1 PDS Document Change Notice, 2.1	PO-DN-ESA-GS-428
MRD- 2	ENVISAT-1 PDS Level 0 Product list, Issue 1 20/03/96	PO-TN-ESA-GS-0421
MRD- 3	MERIS Assumptions on the Ground Segment	PO-RS-DOR-SY-0029
MRD- 4	deleted	
MRD- 5	MERIS Space Segment Requirements Specification	PO-RS-ESA-PM-0023
MRD- 6	MERIS Level 1 Detailed Processing Model (DPM L1)	PO-TN-MEL-GS-002
MRD- 7	ECMWF Meteorological Bulletin M1.9/3 - Encoding and decoding GRIB data (GRIBEX)	
MRD- 8	WMO publication No. 306 - Manual on Codes ECMWF Meteorological Bulletin M1.9/4 - Accessing GRIB and BUFR data	
MRD- 9	deleted	
MRD- 10	NOAA Global Relief Data from the National Geophysical Data Center (CDROM)	
MRD- 11	Tables Generation Requirements Document (TGRD)	PO-TN-MEL-GS-0012
MRD- 12	ECMWF - PDS Interface	PO-RP-ESA-GS-00622
MRD- 13	MERIS Level 2 Detailed Processing Model (DPM L2)	PO-TN-MEL-GS-0006
MRD- 14	Mission Conventions Document	PO-IS-ESA-GS-0561

1.4 Terms, Definitions and Abbreviated Terms

Terms, Definitions and Abbreviated Terms are identified in the common volume of the product format specifications in [AD- 2].

2 OVERVIEW OF THE MERIS INSTRUMENT

2.1 ENVISAT-1 Mission

The ENVISAT-1 mission objectives and payload are described in [MRD-1]. The main characteristics of the orbit are recalled in Table 2-1 below.

Table 2-1: ENVISAT-1 orbit characteristics

Semi-major axis	7159.5 km
Eccentricity	0.001165
Argument of perigee	90 °
Inclination	98.549°
Period	100.47 mn
Equator Crossing Time	22:00
Repeat cycle	35 days

The overall concept of the ENVISAT-1 Ground Segment is presented in [MRD-1].

2.2 MERIS Instrument

2.2.1 Configuration

MERIS is a medium spatial resolution imaging spectrometer, operating in push-broom mode on a swath width of 1150 km. It provides simultaneously 15 spectral bands selectable in the visible and near-infra-red domain (390 to 1040 nm wavelength at 1.25 nm sampling interval). A reference set of bands is shown in Table 2-2 below. It should be noted that the finalisation of MERIS bands is the subject of on-going work within the MERIS SAG.

The bands in Table 2-2 below correspond to the three main missions of the instrument:

1. ocean colour;
2. atmosphere aerosols and clouds;
3. land processes.

IMPORTANT NOTE

Level 2 Products are generated according to [MRD-13] only when the spectral bands listed in Table 2-2 are available.

Each MERIS pixel has a field of view of 0.019°. Due to the wide instrument field of view (68°), spatial sampling varies in the across track direction, between 0.26 km at nadir and 0.39 km at swath extremities. Along-track sampling is close to 0.29 km.

MERIS has the capability to output data sampled at the Full Resolution (FR) with the spatial sampling described above, and Reduced Resolution (RR) data sub-sampled at 1.2 km.

Table 2-2: Definition of the MERIS bands

No.	Band centre (nm)	Band width (nm)	Application
1	412.5	10	Yellow substance and detrital pigments
2	442.5	10	Chlorophyll absorption maximum
3	490	10	Chlorophyll and other pigments
4	510	10	Suspended sediment, red tides
5	560	10	Chlorophyll absorption minimum
6	620	10	Suspended sediment
7	665	10	Chlorophyll absorption & fluo. reference
8	681.25	7.5	Chlorophyll fluorescence peak
9	708.75	10	Fluo. reference, atmosphere corrections
10	753.75	7.5	Vegetation, cloud
11	760.625	3.75	O_2 R- branch absorption band
12	778.75	15	Atmosphere corrections
13	865	20	Vegetation, water vapour reference
14	885	10	Atmosphere corrections
15	900	10	Water vapour, land

2.2.2 Operations

MERIS is operating continuously on the day side of the ENVISAT-1 orbit (descending track). RR data is acquired over 43.5 mn in each orbit, i.e. 80% of the descending track, and transmitted directly or via the on-board recorder. FR data is acquired and processed on request for a maximum of 20 mn, in view of X-band stations or DRS (see [MAD-3]).

Radiometric Calibrations are performed periodically at orbital South Pole pass, using on-board dedicated hardware. This allows the monitoring and / or the update of the calibration Auxiliary data.

Wavelength calibration is performed periodically, using on-board dedicated hardware. This allows the monitoring and / or the update of auxiliary data.

3 PRODUCT OVERVIEW

3.1 Product Tree

The MERIS L1 and L2 products available in S3-like format are summarized in Table 3-1:

Table 3-1: MERIS products tree

Product type	Description	Level
ME_1_FRG___	Full Resolution top of atmosphere radiance	Level 1
ME_1_RRG___	Reduced Resolution top of atmosphere radiance	Level 1
ME_2_FRG___	Full Resolution Water, Land, Cloud & Atmosphere geophysical products	Level 2
ME_2_RRG___	Reduced Resolution Water, Cloud, Land & Atmosphere geophysical products	Level 2

3.2 Product Naming Convention

The names of the MERIS products are based on the Sentinel-3 file naming convention, according to [AD- 1], with some adaptations to handle Envisat platform and MERIS sensor. The file MERIS S3-like file naming convention is identified by the sequence of fields described here below:

ENV_ME_*<level>*_*<resolution>*G___*<starttime>*_*<stoptime>*_____*<duration>*_*<cycle>*_*<relativeorbit>*_____*<centre>*_R_NT____.SEN3

with:

- <*level*> (1 char): product level: “1” or “2”
- <*resolution*> (2 chars): product resolution: “FR” (Full Resolution) or “RR” (Reduced Resolution)
- <*starttime*> and <*stoptime*> (15 chars each): product start/stop time following the ISO 8601 datetime format YYYYMMDDTHHMMSS (year, month, day, “T”, hour, minutes, seconds)
- <*duration*> (4 chars): product duration in seconds
- <*cycle*> (3 chars): product cycle number at the start time
- <relativeorbit> (3 chars): product relative orbit number within the cycle at the start time
- <centre> (3 chars): product generating centre

Note that Sentinel-3 “creation date” field (between <*stoptime*> and <*duration*>) is not used for S3-like and replaced by underscores.

Example:

ENV_ME_1_RRG____20080626T093711_20080626T094048_____0217_069_437_____DSI_R_NT____.SEN3

4 MERIS PRODUCT FORMAT SPECIFICATION

4.1 General Product Structure

4.1.1 Package Layout

The format of every MERIS Sentinel-3 like product is described in [AD- 2]. The Product Package is sketched in Figure 4-1.

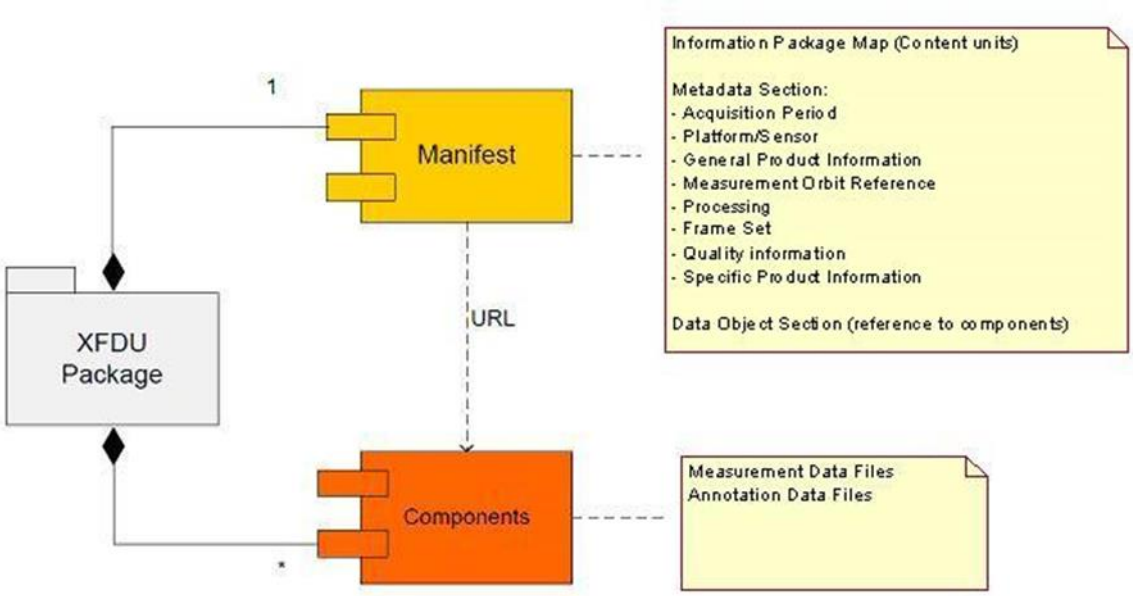

Figure 4-1: XFDU package

In the following sections, the physical composition of each package is specified for the MERIS instrument.

The components of the package that are not part of the current operational production baseline are identified with a flag in the column N.O. (Not Operational). These components might be required to be generated at a later time during the mission lifecycle.

4.1.2 Manifest file

The manifest file is a set of metadata information related to the description of the product. It includes a common structure section, called primary metadata, and a specific section called secondary metadata.

4.1.2.1 Primary Metadata

The primary metadata is contained in various wrapped metadata units within the Sentinel-SAFE manifest: “acquisitionPeriod”, “platform”, "generalProductInformation", “orbitReference”, “processing”, “qualityInformation”, “frameSet”, and “merisProductInformation”. The fields are described in [AD- 5] or when specific to MERIS adapted from it.

4.1.2.2 Secondary Metadata

The secondary metadata section contains the information specific to the instrument, level or mode applied during the processing. The fields are adapted from their OLCI equivalent described in [AD- 5].

4.1.3 Measurement Data Files and Annotation Data Files

The format of the measurement and annotation data files is NetCDF 4.

A NetCDF file contains dimensions, variables, and attributes, which all have both a name by which they are identified. These components can be used together to capture the meaning of data and relations among data fields in an array-oriented data set.

The global attributes defined for each netCDF file composing the products are fully defined in the common volume of the Sentinel-3 Product Data Format Specification documents named "Product structures" and referenced as [AD- 2].

4.1.3.1 Additional global attributes

Additional global attributes common to all MERIS files are specifically defined. These attributes aims at ensuring the self-containment of the dataset. They are defined in the following table and their values should be adapted according to the file.

Table 4-1: Additional Global Attributes for MERIS L1 and L2 files

Element name	Description	T	D
absolute_orbit_number	Absolute orbit number during which data contained within the product have been acquired	u32	1
relative_orbit_number	Relative orbit number during which data contained within the product have been acquired	i32	1
orbit_cycle_number	Orbit cycle number during which data contained within the product have been acquired	i32	1
start_time	Product start date and time (yyyy-mm-ddThh:mm:ss.ssssssZ)	S	1
stop_time	Product stop date and time (yyyy-mm-ddThh:mm:ss.ssssssZ)	S	1
comment	Miscellaneous extra information (empty)	S	1
resolution	Dataset resolution (across- and along-track) in meters unit function of the associated grid and view	S	1

Element name	Description	T	D
ac_subsampling_factor	Across-track FR product pixel to Tie-point subsampling factor	i16	1
al_subsampling_factor	Along-track FR product pixel to Tie-point subsampling factor	i16	1

4.2 Earth Observation Products

4.2.1 Level 1 Products: ME_1_FRG___/ME_1_RRG___

4.2.1.1 Package Description

An "ME_1_FRG___" product is composed of 22 measurement data files: 21 files containing radiances at each band (one band per file), accompanied by the associated error estimates, plus an additional file providing all data related to pixels that have been removed during the re-sampling process.

The "ME_1_RRG___" product contains the same files except the one related to removed pixels.

4.2.1.1.1 ME_1_FRG___ product summary

Table 4-2: MERIS Full Resolution Level 1 product physical composition

Product Package Type ME_1_FRG___, ME_1_RRG___		*Description* MERIS Level 1 full resolution product at full spatial resolution / at reduced spatial resolution			
Product Level	**Diss. Timeliness**	**Product Category**	**Application Domain**		**Spatial Resolution**
1	NRT NTC	Available to the user	LND MRT		300m
Product Dissemination Unit Frame		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		24[1]	15	7	0
Product Package Structure					
Manifest file (see section 4.2.1.2 and 5 for more details)					
File name		**Composition**			
xfdumanifest.xml		XML fields			
Measurement Data files (see section 4.2.1.3 for more details)					
File name		**Composition**			**N.O.**
M01_radiance.nc		M01_radiance, M01_radiance_err			
M02_radiance.nc		M02_radiance, M02_radiance_err			
… continue		… continue			
M15_radiance.nc		M15_radiance, M15_radiance_err			
Annotation Data files (see section 4.2.1.4 and 4.2.3 for more details)					**N.O**
File name		**Composition**			
time_coordinates.nc		time_stamp			

[1] Number of Package components includes the manifest and the OLQC Report (the latter being optional, the number of components may be decreased by 1).

geo_coordinates.nc	longitude, latitude and altitude	
qualityFlags.nc	quality_flags	
tie_geo_coordinates.nc	longitude, latitude and altitude	
tie_geometries.nc	SZA, SAA, OZA, OAA	
tie_meteo.nc	horizontal_wind, sea_level_pressure, total_ozone, humidity, reference_pressure_level, atmospheric_temperature_profile, total_columnar_water_vapour	
instrument_data.nc	lambda0, FWHM, solar_flux, detector_index, frame_offset, relative_spectral_covariance	
Representation Information Files		**N.O**
File name	**Composition**	
none		

4.2.1.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

4.2.1.2.1 Wrapped Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all MERIS Sentinel-3 like products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the MERIS instrument are reported in Table 4-3. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized>

Table 4-3: Secondary Metadata for MERIS products

4.2.1.3 Measurement Data Files

4.2.1.3.1 Radiance: M##_radiance.nc

Each radiance file is composed of TOA radiances at the band M## on the product grid, and their corresponding error estimates.

Table 4-4: ME_1_FRG___/ME_1_RRG___: radiance M## description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
M##_radiance	**Radiance for MERIS acquisition band ##**	**[0, 2^{16} – 2]**	**us**	**rows columns**
standard_name	CF standard name	TOA_upwelling_spectral_radiance		1
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	2^{16} – 1		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
ancillary_variables	List of variables that are closely associated to this data	M##_radiance_err		1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
M##_radiance_err	**Error estimate for MERIS acquisition band ##**		**us**	**rows columns**
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1

Element name	Description	Range or value	T	D
_FillValue	Value indicating missing data	$2^{16} - 1$		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		1

4.2.1.4 Annotation Data Files

4.2.1.4.1 Quality Flags: qualityFlags.nc

This file contains classification and quality flags for each pixel. It comprises the following flags:

- Land/ saline water mask (based on a priori knowledge),
- Fresh inland water mask (based on a priori knowledge),
- Tidal regions mask (based on a priori knowledge),
- Coastline mask (based on a priori knowledge),
- Preliminary Cloud mask (bright pixels),
- Identification of pixels without accurate per-pixel geo-location (only tie-points geo-location available)
- Identification of invalid pixels,
- Identification of pixels where sun glint might occurs (computed in function of the viewing and sun geometries as well as the wind conditions at water surface,
- Identification of saturated samples

- Identification of “dubious” samples or pixels of potentially lower quality,
- Identification of cosmetic pixels (containing at least one sample filled with cosmetic data),
- Identification of duplicated pixels (as a consequence of the re-sampling process on an even product grid)

Table 4-5: ME_1_FRG___/ME_1_RRG___: quality flags annotation data file description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
quality_flags	**Classification and quality flags**		**ul**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See Table 4-7	ul	31
flag_meanings	List of flag meanings composing this variable	See Table 4-7	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Description of the structure of the 4 bytes regrouping all Classification and Quality flags of the L1b products is given in the table below (see the conventions detailed in volume 1 for the ordering of the bytes and bits):

Table 4-6 – Detailed structure of the quality flags variable

byte \ bit	7	6	5	4	3	2	1	0
3	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
2	**I**	**J**	**K**	**L1**	**L2**	**L3**	**L4**	**L5**
1	**L6**	**L7**	**L8**	**L9**	**L10**	**L11**	**L12**	**L13**
0	**L14**	**L15**	**s**	**s**	**s**	**s**	**s**	**s**

With:

- **A**: **Land / saline Water flag** set to '1' if the pixel is over land, '0' if it is over water.
- **B**: **Coastline flag** set to '1' if the pixel is on coastline
- **C**: **Fresh Inland Water flag** set to '1' if the pixel is over fresh water rivers or lakes
- **D**: **Tidal regions flag** set to '1' if the pixel is over a tidal region
- **E**: **Preliminary Cloud flag** (bright pixel) set to '1' if the pixel is bright
- **F: "geoloc_invalid" Pixel flag** set to '1' if accurate per-pixel geo-location is not available for this pixel (only tie-points geo-location available)
- **G**: **Invalid Pixel flag** set to '1' if the pixel is invalid, i.e. its value is missing either because out of the instrument swath or because of missing or unusable Level 0 data.
- **H**: **Cosmetic Pixel flag** set to '1' if the pixel has been filled with cosmetic values.
- **I**: **Duplicated Pixel flag** set to '1' if the pixel is derived from the same instrument pixel as one of its neighbour during the re-sampling process.
- **J: Sun-Glint Risk flag** set to '1' if the viewing and wind conditions are such that the Sun may cause glint to occur on pixels over water surfaces (This flag is set only on the basis of sun and viewing angles taking into account wind conditions, but it is not set according to radiometric data)
- **K**: **"Dubious" Pixel flag** set to '1' if any pixel's sample is potentially contaminated by a neighbour saturated sample or if the Instrument Source Packet it was extracted from is corrupted.
- **Li**: **Saturated Sample flag** set to '1' if the sample of band Mi is saturated.
- ***s***: spare bits, to be ignored (set to 0).

The list of values allowed for the flag_masks and flag_meanings attributes is detailed in the table below.

Table 4-7 – List of allowed values to be taken by flags attributes

flag_masks	flag_meanings
80000000h	land (‘0’ = saline water)
40000000h	coastline
20000000h	fresh_inland_water
10000000h	tidal_region
08000000h	bright
04000000h	straylight_risk
02000000h	invalid
01000000h	cosmetic
00800000h	duplicated
00400000h	sun-glint_risk
00200000h	dubious
00100000h	saturated@M01
00080000h	saturated@M02
00040000h	saturated@M03
00020000h	saturated@M04
00010000h	saturated@M05
00008000h	saturated@M06
00004000h	saturated@M07

flag_masks	flag_meanings
00002000h	saturated@M08
00001000h	saturated@M09
00000800h	saturated@M10
00000400h	saturated@M11
00000200h	saturated@M12
00000100h	saturated@M13
00000080h	saturated@M14
00000040h	saturated@M15
00000020h	spare
00000010h	spare
00000008h	spare
00000004h	spare
00000002h	spare
00000001h	spare

4.2.2 Level 2 Products: ME_2_FRG___/ME_2_RRG___

4.2.2.1 Package Description

An “ME_2_FRG___/ME_2_RRG___” product is composed by a 24 measurement files containing:

- 13 reflectance files containing the Water-leaving reflectance for all bands except those dedicated to measurement of atmospheric gas (M11 and M15) absorption.
- OC4Me Chlorophyll concentration file
- Neutral Net Chlorophyll concentration file
- Neutral Net Total suspended Matter concentration file
- Transparency Products file
- A Neural Net Water inherent Optical Properties file
- A Photosynthetically Active Radiation file
- Aerosol Over Water file
- 13 reflectance files containing the Land surface reflectance for all bands except those dedicated to measurement of atmospheric gas (M11 and M15) absorption.
- MERIS Global vegetation Index file
- Terrestrial Chlorophyll Index file
- Aerosol Over Land file
- Surface pressure
- 13 reflectance files containing the TOA reflectance for all bands except those dedicated to measurement of atmospheric gas (M11 and M15) absorption.
- Cloud albedo, optical thickness and type
- Cloud top pressure
- Integrated Water Vapour

4.2.2.1.1 ME_2_FRG___ / ME_2_RRG___ product summary

Table 4-8: MERIS Level 2 Water product physical composition

Product Package Type ME_2_FRG___, ME_2_RRG___		*Description* Water, Land, Cloud and atmospheric geophysical products at full spatial resolution / at reduced spatial resolution			
Product Level	**Diss. Timeliness**	**Product Category**	**Application Domain**		**Spatial Resolution**
2	NRT NTC	Available to the user	MRT ATM		300m / 1km
Product Dissemination Unit Frame (ME_2_FRG___)/ Stripe (ME_2_RRG___)		Number of Package components	Number of Measurement Data Files	Number of Annotation Data Files	Number of Representation Information Files
		33[2]	24	7	0

Product Package Structure		
Manifest file (see section 4.2.2.2 and 5 for more details)		
File name	**Composition**	
xfdumanifest.xml	XML fields	
Measurement Data files (see section 4.2.2.3 for more details)		**N.O**
File name	**Composition**	
M01_rho_w/top/TOA.nc	M01_rho_w/top/TOA, M01_rho_w/top/TOA _err	X
M02_rho_w/top/TOA.nc	M02_rho_w/top/TOA, M02_rho_w/top/TOA _err	X
…continue	…continue	
M10_rho_w/top/TOA.nc	M10_rho_w/top/TOA, M10_rho_w/top/TOA_err	X
M12_rho_w/top/TOA.nc	M12_rho_w/top/TOA, M12_rho_w/top/TOA_err	X
M13_rho_w/top/TOA.nc	M13_rho_w/top/TOA, M13_rho_w/top/TOA_err	X
M14_rho_w/top/TOA.nc	M14_rho_w/top/TOA, M14_rho_w/top/TOA_err	X
chl_oc4me.nc	CHL_OC4ME, CHL_OC4ME_err	

[2] Number of Package components includes the manifest and the OLQC Report (the latter being optional, the number of components may be decreased by 1).

chl_nn.nc	CHL_NN, CHL_NN_err	
tsm_nn.nc	TSM_NN, TSM_NN_err	
trsp.nc	KD490_M07, KD490_M07_err	
iop_nn.nc	ADG_443_NN, ADG_443_NN_err	
par.nc	PAR, PAR_err	
w_aer.nc	T865, T865_err, A865, A865_err	
iwv.nc	IWV, IWV_err	
MGVI.nc	MGVI, MGVI_err	
MTCI.nc	MTCI, MTCI_err, MTCI_QS	
l_aer.nc	T442, T442_err, A442, A442_err, Q	
psurf.nc	PSURF	
cloud.nc	CALB, COT, CTYPE	
ctp.nc	CTP	
Annotation Data files (see section 4.2.2.4 and 4.2.3 for more details)		**N.O**
File name	**Composition**	
rc_MGVI.nc	RC681, RC681_err, RC865, RC865_err	
time_coordinates.nc	time_stamp	
geo_coordinates.nc	longitude, latitude and altitude	
common_flags.nc	ES, CC, CO	
wqsf.nc	WP_QS, WP_PC	
lqsf.nc	LP_QS, LP_PC	
cqsf.nc	CP_QS, CP_PC	
tie_geo_coordinates.nc	longitude, latitude and altitude	
tie_geometries.nc	SZA, SAA, OZA, OAA	
tie_meteo.nc	horizontal_wind, sea_level_pressure, total_ozone, humidity, reference_pressure_level, atmospheric_temperature_profile, total_columnar_water_vapour	
instrument_data.nc	lambda0, FWHM, solar_flux, detector_index, frame_offset, relative_spectral_covariance	
Representation Information Files		**N.O**
File name	**Composition**	
none		

4.2.2.2 Manifest File

The structure of the Manifest element is described in [AD- 2].

4.2.2.2.1 Wrapped Metadata

According to [AD- 2], Wrapped Metadata are grouped in Primary Metadata, common to all MERIS Sentinel-3 like products and Secondary Metadata, specific for instrument and processing level.

Primary Metadata are described in [AD- 2].

Secondary Metadata for the MERIS instrument are reported in Table 4-3. Last columns of the table indicate the applicability of Metadata fields to the processing Level.

< Complete secondary metadata is described in details in [AD- 4].
The content of this table will be embedded in the document when it will be finalized>

Table 4-9: Secondary Metadata for MERIS products

4.2.2.3 Measurement Data Files

4.2.2.3.1 Reflectance

Each reflectance file is composed of reflectances at the band M## on the product grid, and their corresponding error estimates. Reflectance variable corresponds to BAC or AAC: baseline or alternative atmospheric correction models.

Table 4-10: ME_2_FRG___/ME_2_RRG___ M##_reflectance description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
Atmospheric_Correction	Model of atmospheric correction applied during the processing	AAC or BAC	st	1
M##_ rho_w/top/TOA	**Reflectance for MERIS acquisition band ##**		**us**	**rows columns**
_FillValue	Value indicating missing data	65535		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
M##_ rho_w/top/TOA_err	**Error estimates for MERIS acquisition band ##**		**us**	**rows columns**
_FillValue	Value indicating missing data	$2^{16} - 1$		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.2 OC4Me Chlorophyll concentration file

Table 4-11: ME_2_FRG___/ME_2_RRG___ chl_oc4me description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
CHL_OC4ME	**log10 scaled (OC4ME) Algal pigment concentration**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
units	UDUNITSunit name	mg.m-3		
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
CHL_OC4ME_err	**log10 scaled Error estimate for the (OC4ME) algal pigment concentration**		**uc**	**rows columns**
units	UDUNITS unit name	mg.m-3		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.3 Neutral Net Chlorophyll concentration file

Table 4-12: ME_2_FRG___/ME_2_RRG___ chl_nn description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
CHL_NN	**log10 scaled (Neural Net) Algal pigment concentration**		**uc**	**rows columns**
units	UDUNITS unit name	mg.m-3		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
CHL_NN_err	**log10 scaled Error estimate for the (Neural Net) algal pigment concentration**		**uc**	**rows columns**
units	UDUNITS unit name	mg.m-3		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.4 Neutral Net Total Suspended Matter concentration file

Table 4-13: ME_2_FRG___/ME_2_RRG___ tsm_nn description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
TSM_NN	**log10 scaled (Neural Net) Total suspended matter concentration**		**uc**	**rows columns**
units	UDUNITS unit name	g.m-3		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
TSM_NN_err	**log10 scaled Error estimate for the (Neural Net) Total suspended matter concentration**		**uc**	**rows columns**
units	UDUNITS unit name	g.m-3		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.5 Transparency Products file

Table 4-14: ME_2_FRG___/ME_2_RRG___ trsp description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
KD490_M07	**log10 scaled (M07) Diffuse attenuation coefficient**		**uc**	**rows columns**
units	UDUNITS unit name	m-1		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
KD490_M07_err	**log10 scaled Error estimate for the (M07) Diffuse attenuation coefficient**		**uc**	**rows columns**
units	UDUNITS unit name	m-1		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.6 Neural Net Water inherent Optical Properties file

Table 4-15: ME_2_FRG___/ME_2_RRG___ iop_nn description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
ADG443_NN	**log10 scaled (Neural Net) CDM absorption coefficient**		**uc**	**rows columns**
units	UDUNITS unit name	m-1		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
ADG443_NN_err	**log10 scaled Error estimate for the (Neural Net) CDM absorption coefficient**		**uc**	**rows columns**
units	UDUNITS unit name	m-1		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.7 Photosynthetically Active Radiation file

Table 4-16: ME_2_FRG___/ME_2_RRG___ par description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
PAR	**Photosynthetically active radiation**		**uc**	**rows columns**
units	UDUNITS unit name	W.m-2		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
PAR_err	**Error estimate for the Photosynthetically active radiation**		**uc**	**rows columns**
units	UDUNITS unit name	W.m-2		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.8 Aerosol Over Water file

Table 4-17: ME_2_FRG___/ME_2_RRG___ w_aer description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
T865	**Aerosol optical thickness**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
T865_err	**Error estimate for the Aerosol optical thickness**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
A865	**Aerosol Angström exponent**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
A865_err	**Error estimate for the Aerosol Angström exponent**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1

Element name	Description	Range or value	T	D
add_offset	Offset used to in decoding packed data			1

4.2.2.3.9 Aerosol Over Land file

Table 4-18: ME_2_FRG___/ME_2_RRG___ l_aer description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
T442	**Aerosol optical thickness**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
T442_err	**Error estimate for the Aerosol optical thickness**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
A442	**Aerosol Angström exponent**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
A442_err	**Error estimate for the Aerosol Angström exponent**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1

Element name	Description	Range or value	T	D
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
Q	**ARVI quality index**	**[0, 10]**	**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1

4.2.2.3.10 MERIS Global Vegetation Index file

Table 4-19: OL_2_LFR___/OL_2_LRR___ MGVI description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
MGVI	**MERIS Global Vegetation Index**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
MGVI_err	**Error estimate for the MERIS Global Vegetation Index**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.11 Terrestrial Chlorophyll Index file

Table 4-20: OL_2_LFR___/OL_2_LRR___ MTCI description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
MTCI	**MERIS Terrestrial Chlorophyll Index**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
MTCI_err	**Error estimate for the MERIS Terrestrial Chlorophyll Index**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
LP_QS_MTCI	**MERIS Terrestrial Vegetation Index Quality Flags**		uc	rows columns
flag_masks	**List of bit fields describing boolean or enumerated flags**		uc	8
flag_meanings	**List of flag meanings composing this variable**		st	1
flag_values	**List of the flag values used in conjunction with flag_meanings**		uc	8

4.2.2.3.11.1 MTCI_quality_flags meanings

Bit	Flag Name	Flag Meaning
00 & 01	Soil status	Soil status: 3=GOOD_SOIL, 0=POOR_SOIL (2 & 1 not used)
02 & 03	Reserved for future use	Both bits always set to 1 (value=12)
04 & 05	Acquisition geometry quality	Acquisition geometry quality: 48=BEST_GEOMETRY, 32=GOOD_GEOMETRY, 16=FAIR_GEOMETRY , 0=POOR_GEOMETRY
06 & 07	MTCI i/o range quality	MTCI i/o range quality: 192=GOOD_RANGE (i & o in range), 0=BAD_RANGE (i or o out of range)

4.2.2.3.12 Surface Pressure file

Table 4-21: OL_2_LFR___/OL_2_LRR___ PSURF description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
PSURF	**Surface pressure**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.13 Cloud file

Table 4-22: OL_2_LFR___/OL_2_LRR___ cloud description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
CALB	**Cloud Albedo**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
COT	**Cloud Optical Thickness**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
CTYPE	**Cloud Type**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.14 Cloud Top Pressure file

Table 4-23: OL_2_LFR___/OL_2_LRR___ CTP description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
CTP	**Cloud Top Pressure**		**uc**	**rows columns**
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.3.15 Integrated Water Vapour

Table 4-24: ME_2_FRG___/ME_2_RRG___/ OL_2_LFR___/OL_2_LRR IWV description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
IWV	**Integrated water vapour column above the current pixel**		**uc**	**rows columns**
units	UDUNITS unit name	kg.m-2		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
IWV_err	**Error estimate for the Integrated water vapour column above the current pixel**		**uc**	**rows columns**
units	UDUNITS unit name	kg.m-2		1
_FillValue	Value indicating missing data	255		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.4 Annotation Data Files

See in [MRD-13] for a more detailed description Level-2 flags.

4.2.2.4.1 Common Flags file

Table 4-25: ME_2_FRG___/ME_2_RRG___ common flags description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
ES	**Earth surface classification flags**		**us**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table** 4-26	us	9
flag_meanings	List of flag meanings composing this variable	See **Table** 4-26	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
CC	**Cloud classification flags**		**uc**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table** 4-27	uc	3
flag_meanings	List of flag meanings composing this variable	See **Table** 4-27	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Element name	Description	Range or value	T	D
CO	**Common flags**		**ul**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table** 4-28	ul	27
flag_meanings	List of flag meanings composing this variable	See **Table** 4-28	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 4-26: ME_2_FRG___/ME_2_RRG___ Earth surface flags meaning

Bit	Flag Name
00	LAND_MAP
01	LAND_RADIOMETRIC
02	OCEAN_MAP
03	OCEAN_RADIOMETRIC
04	COASTLINE
05	TIDAL_MAP
06	INLAND_WATER_MAP
07	FLOODED_RADIOMETRIC
08	DRY_FALLEN_RADIOMETRIC
09-15	spare

Table 4-27: ME_2_FRG___/ME_2_RRG___ Cloud classification flags meaning

Bit	Flag Name
00	CLOUD
01	CLOUD_AMBIGUOUS
02	CIRRUS
03-07	spare

Table 4-28: ME_2_FRG___/ME_2_RRG___ Common flags meaning

Bit	Flag Name
00	INVALID
01	COSMETIC
02	DUPLICATED
03	GLINT_RISK
04	SUSPECT
05	BRIGHT
06	HISOLZEN
07	GEOLOC_INVALID
08	DO_LAND
09	DO_WATER
10	DO_CLOUD
11	RHO_TOA_FAIL

Bit	Flag Name
12-26	SATURATED_01-15
27-31	spare

4.2.2.4.2 Ocean Products Quality & Science Flags file

Table 4-29: ME_2_FRG___/ME_2_RRG___ WQSF flags description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
WP_QS	**Quality and science flags for Marine and Inland Waters products.**		**ull**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table** 4-30	ull	39
flag_meanings	List of flag meanings composing this variable	See **Table** 4-30	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
WP_PC	**Quality and science flags for Marine and Inland Waters products.**		**us**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table 4-31**	us	10
flag_meanings	List of flag meanings composing this variable	See **Table 4-31**	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 4-30: ME_2_FRG___/ME_2_RRG___ Water products Quality and Science flags meaning

Bit	Flag Name

Bit	Flag Name
00	SEA_ICE
01	MEGLINT
02	HIGHGLINT
03	CASE2_S
04	CASE2_ANOM
05	HAZE_OVER_WATER
06	WHITECAPS
07	AC_FAIL
08	BPAC_ON
09	WHITE_SCATT
10	LOWRW
11	HIGHRW
12	OUT_OF_RANGE_AAC
13	OUT_OF_SCOPE_AAC
14	OUT_OF_RANGE_OC_NN
15	OUT_OF_SCOPE_OC_NN
16	OUT_OF_RANGE_CHL_OC4ME_INPUT
17	OUT_OF_RANGE_CHL_OC4ME
18-31	spare
32	ANNOT_ANGSTROM

Bit	Flag Name
33	ANNOT_AERO_B
34	ANNOT_ABSO_D
35	ANNOT_ACLIM
36	ANNOT_ABSOA
37	ANNOT_MIXR1
38	ANNOT_DROUT
39	ANNOT_TAU06
40-52	RWNEG_01-10,12,13,14
53-63	spare

The scope of the following table is to associate a quality flag to each of the geophysical parameter; it is therefore the reverse mapping wrt the above table.

Table 4-31: ME_2_FRG___/ME_2_RRG___ : Water Products Quality Masking

Bit	Flag Name
00	RHO_W_FAIL
01	CHL_OC4ME_FAIL
02	CHL_NN_FAIL
03	TSM_NN_FAIL
04	ADG443_NN_FAIL

Bit	Flag Name
05	KD490_M07_FAIL
06	PAR_FAIL
07	T865_FAIL
08	A865_FAIL
09	IWV_FAIL
10-15	spare

4.2.2.4.3 Land Products Quality & Science Flags file

Table 4-32: ME_2_FRG___/ME_2_RRG___ LQSF flags description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
LP_QS	**Quality and science flags for Land products.**		**us**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See Table 4-33	us	11
flag_meanings	List of flag meanings composing this variable	See Table 4-33	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
LP_PC	**Quality and science flags for Land products.**		**us**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See Table 4-34	us	9
flag_meanings	List of flag meanings composing this variable	See Table 4-34	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 4-33: ME_2_FRG___/ME_2_RRG___ Land products Quality and Science flags meaning

Bit	Flag Name
00	SNOW_ON_LAND
01	LRAYFAIL
02	MGVI_CLASS_BAD
03	MGVI_CLASS_WS
04	MGVI_CLASS_CSI
05	MGVI_CLASS_BRIGHT
06	MGVI_CLASS_INVAL_REC
07	OUT_OF_RANGE_MGVI_INPUT
08	OUT_OF_RANGE_MGVI
09	OUT_OF_RANGE_MTCI_INPUT
10	OUT_OF_RANGE_MTCI
11-15	spare

Table 4-34: ME_2_FRG___/ME_2_RRG___ : Land Products Quality Masking

Bit	Flag Name
00	RHO_TOP_FAIL
01	MGVI_FAIL
02	RC681_FAIL
03	RC865_FAIL
04	MTCI_FAIL

Bit	Flag Name
05	T442_FAIL
06	A442_FAIL
07	PSURF_FAIL
08	IWV_FAIL
09-15	spare

4.2.2.4.4 Rectified Reflectance file

Table 4-35: OL_2_LFR___/OL_2_LRR___ rc_MGVI description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
RC681	**Rectified reflectance for the red band**		**us**	**rows columns**
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	65535		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
RC681_err	**Error estimates for the Rectified reflectance for the red band**		**us**	**rows columns**
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	65535		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1
RC865	**Rectified reflectance for the near infrared band**		**us**	**rows columns**
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	65535		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

Element name	Description	Range or value	T	D
RC865_err	**Error estimates for the Rectified reflectance for the near infrared band**		**us**	**rows columns**
units	UDUNITS unit name	mW.m-2.sr-1.nm-1		1
_FillValue	Value indicating missing data	65535		1
scale_factor	Scaling factor used in decoding packed data			1
add_offset	Offset used to in decoding packed data			1

4.2.2.4.5 Cloud Products Quality & Science Flags file

Table 4-36: ME_2_FRG___/ME_2_RRG___ CQSF flags description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
CP_QS	**Quality and science flags for Cloud products.**		**uc**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table** 4-30	uc	4
flag_meanings	List of flag meanings composing this variable	See **Table** 4-30	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		
CP_PC	**Quality and science flags for Cloud products.**		**uc**	**rows columns**
flag_masks	List of bit fields describing boolean or enumerated flags	See **Table 4-31**	uc	4
flag_meanings	List of flag meanings composing this variable	See **Table 4-31**	st	1
coordinates	List of auxiliary coordinates variables related to the variable	time_stamp altitude latitude longitude		

Table 4-37: ME_2_FRG___/ME_2_RRG___ Cloud products Quality and Science flags meaning

Bit	Flag Name
00	OUT_OF_RANGE_CALB_INPUT

Bit	Flag Name
01	OUT_OF_RANGE_CALB
02	OUT_OF_RANGE_COT_INPUT
03	OUT_OF_RANGE_COT
04-07	spare

Table 4-38: ME_2_FRG___/ME_2_RRG___ : Cloud Products Quality Masking

Bit	Flag Name
00	CTP_FAIL
01	CALB_FAIL
02	COT_FAIL
03	CTYPE_FAIL
04-07	spare

4.2.3 Common Annotation Files

In the following sections, the content of the common ADS (annotation datasets) is detailed.

4.2.3.1 Time Coordinates

Table 4-39: Time annotation data file description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)		st	1
time_stamp	**Measurement Time Stamp for each line of the product - not accounting for leap seconds (31-Dec 2005,2008 at 23:59:60)**		**sll**	**rows**
standard_name	CF Standard name	time		1
units	UDUNITS unit name	“microseconds since 2000-01-01 00:00:00”		1
_FillValue	Default value for missing data	-1		

4.2.3.2 Geo Coordinates

Table 4-40: Geo coordinates annotation data file description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product image**			
columns	**Number of columns in the product image**	**FR: 4481 RR: 1121**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
longitude	**DEM corrected longitude**	**]-180; 180]**	**sl**	**rows columns**
standard_name	CF Standard name	longitude		1
units	UDUNITS unit name	degrees_east		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
latitude	**DEM corrected geodetic latitude**	**[-90; 90]**	**sl**	**rows columns**
standard_name	CF Standard name	latitude		1
units	UDUNITS unit name	degrees_north		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
altitude	**Surface elevation above reference ellipsoid**	**[-1000; 9000]**	**ss**	**rows columns**
standard_name	CF Standard name	altitude		1
units	UDUNITS unit name	m		1

4.2.3.3 Geo Coordinates Tie-Points

Table 4-41: Geo coordinates tie points annotation data file description

Element name	Description	Range or value	T	D
tie_rows	**Number of tie point rows in the product**			
tie_columns	**Number of tie point columns in the product**	**77**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
longitude	**Longitude at tie points**	**]-180; 180]**	**sl**	**tie_rows tie_columns**
standard_name	CF Standard name	longitude		1
units	UDUNITS unit name	degrees_east		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
latitude	**Latitude at tie points**	**[-90; 90]**	**sl**	**tie_rows tie_columns**
standard_name	CF Standard name	latitude		1
units	UDUNITS unit name	degrees_north		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
latitude	**Altitude at tie points**	**[-1000; 9000]**	**ss**	**tie_rows tie_columns**
standard_name	CF Standard name	altitude		1
units	UDUNITS unit name	m		1

4.2.3.4 Geometries Tie-Points

Table 4-42: Geometries tie points annotation data file description

Element name	Description	Range or value	T	D
tie_rows	**Number of tie point rows in the product**			
tie_columns	**Number of tie point columns in the product**	**77**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
SZA	**Sun Zenith Angle at tie points**	**[0; 180]**	**ul**	**tie_rows tie_columns**
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		
SAA	**Sun Azimuth Angle at tie points**	**]-180; 180]**	**sl**	**tie_rows tie_columns**
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		
OZA	**Observation (Viewing) Zenith Angle at tie points**	**[0; 180]**	**ul**	**tie_rows tie_columns**
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		
OAA	**Observation (Viewing) Azimuth Angle at tie points**	**]-180; 180]**	**sl**	**tie_rows tie_columns**
units	UDUNITS unit name	degrees		1
scale_factor	Value to be multiplied to packed data to unpack it	1.e-6		1
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		

4.2.3.5 Meteorology Tie-Points

Table 4-43: Meteorological tie points annotation data file description

Element name	Description	Range or value	T	D
tie_rows	**Number of tie point rows in the product**			
tie_columns	**Number of tie point columns in the product**	**77**		
tie_pressure_levels	**Number of pressure levels in the temperature profile provided at Tie Points**	**25**		
wind_vectors	**Dimensions for wind vector**	**2**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
horizontal_wind	**Horizontal wind vector at 10m altitude**	**[-100; 100]**	**fl**	**tie_rows tie_columns wind_vectors**
units	UDUNITS unit name	m.s-1		1
_FillValue	Default value for missing data	9.96921e36		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
sea_level_pressure	**Mean sea level pressure**	**[0; 1500]**	**fl**	**tie_rows tie_columns**
standard_name	CF Standard name	“air_pressure_at_sea_level”		1
units	UDUNITS unit name	hPa		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
total_ozone	**Total columnar ozone**	**[0; 100]**	**fl**	**tie_rows tie_columns**
standard_name	CF Standard name	“atmosphere_mass_content_of_ozone”		1
units	UDUNITS unit name	Kg.m-2		1

Element name	Description	Range or value	T	D
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
humidity	**Relative humidity**	**[0; 100]**	**fl**	**tie_rows tie_columns**
standard_name	CF Standard name	“relative_humidity”		1
units	UDUNITS unit name	%		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
reference_pressure_level	**Reference pressure levels**	**[0; 1500]**	**fl**	**tie_pressure_levels**
standard_name	CF Standard name	“air_pressure”		1
units	UDUNITS unit name	hPa		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
atmospheric_temperature_profile	**Atmospheric temperature profile**	**[0; 400]**	**fl**	**tie_rows tie_columns tie_pressure_levels**
standard_name	CF Standard name	“air_temperature”		1
units	UDUNITS unit name	K		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1
ancillary_variables	List of variables that are closely associated to this data	reference_pressure_level		1
total_column_water_vapour	**Total column water vapor**	**[0; 100]**	**fl**	**tie_rows tie_columns**
standard_name	CF Standard name	“atmosphere_water_vapor_content”		1

Element name	Description	Range or value	T	D
units	UDUNITS unit name	Kg.m-2		1
_FillValue	Default value for missing data	-1		
coordinates	List of auxiliary coordinates variables related to the variable	latitude longitude		1

Note: The atmospheric_temperature_profile variable is a 3 dimensional array. Information is provided at the tie point position and at different altitudes defined by pressure levels. Those levels are defined through the variable "reference pressure level"

4.2.3.6 Instrument Data

Table 4-44: Instrument data annotation data file description

Element name	Description	Range or value	T	D
rows	**Number of rows in the product**			
columns	**Number of columns in the product**	**FR: 4481 RR: 1121**		
bands	**Number of MERIS acquisition bands**	**21**		
detectors	**Number of detectors**	**3700**		
<common global attributes>	Common global attributes (including additional as defined in 4.1.3.1)			
detector_index	**Detector index**	**[0; 3699]**	**ss**	**rows columns**
_FillValue	Default value for missing data	-1		1
frame_offset	**Re-sampling along-track frame offset**	**[-15; 15]**	**ss**	**detectors**
ancillary_variables	List of variables that are closely associated to this data	“detector_index”		
lambda0	**MERIS pixels characterized central wavelength**	**[390; 1040]**	**fl**	**bands detectors**
units	UDUNITS unit name	nm		1
_FillValue	Default value for missing data	-1		1
ancillary_variables	List of variables that are closely associated to this data	“detector_index FWHM”		
FWHM	**MERIS bandwidths (Full Widths at Half Maximum)**	**[0; 650]**	**fl**	**bands detectors**
units	UDUNITS unit name	nm		1
_FillValue	Default value for missing data	-1		1
ancillary_variables	List of variables that are closely associated to this data	“detector_index lambda0”		

Element name	Description	Range or value	T	D
solar_flux	**In-band solar irradiance, seasonally corrected.**	**[500; 2500]**	**fl**	**bands detectors**
units	UDUNITS unit name	mW.m-2.nm-1		1
_FillValue	Default value for missing data	-1		1
ancillary_variables	List of variables that are closely associated to this data	“detector_index lambda0”		
relative_spectral_covariance	**Relative spectral covariance matrix**		**fl**	**bands bands**
ancillary_variables	List of variables that are closely associated to this data	“detector_index lambda0”		

5 MANIFEST FILE DESCRIPTION

The purpose of this section is to describe in detail all the data sets that are included with any of the Envisat MERIS product. Most of the description are common to all products and are therefore described in [AD- 2].

Only the IPF specific parts are detailed in this section.

5.1 InformationPackageMap

5.1.1 "ME_1_FRG___/ME_1_RRG___" Level 1 Product

The Information Package Map associated to the package of the ME_1_FRG___/ME_1_RRG___ product is reported in the next table.

Table 5-1: Information Package Map for L1 MERIS product

Name				Description	Data Type	Value	Occ.
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	"packageUnit"	0..1
	unitType			Describes the type of data referenced by this content unit	S	"Information Package"	0..1
	textInfo			Textual description of the content unit	S	"ENVISAT MERIS Level 1 Earth Observation Full Resolution Product"	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	"processing"	1
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : "acquisitionPeriod" " platform" "orbitReference" "qualityInformation" "processing" "frameSet" "generalProductInformation" "merisProductInformation"	1
	contentUnit						1…15

Name				Description	Data Type	Value	Occ.
		ID		Content unit ID	S	“Mxx_radianceUnit”, xx = 01, 02, …, 15	
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	TOA radiance for MERIS acquisition band Mxx xx = 01, 02, …, 15	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “qualityFlagsData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“Mxx_radianceData”, xx = 01, 02, …, 15	1
	contentUnit						1
		ID		Content unit ID	S	geoCoordinatesUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Geo Coordinates Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	‘timeCoordinatesData’	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“geoCoordinatesData”	1
	contentUnit						1
		ID		Content unit ID	S	qualityFlagsUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Quality flags”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: timeCoordinatesData geoCoordinatesData	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“qualityFlagsData”	1
	contentUnit						1
		ID		Content unit ID	S	"tieGeoCoordinatesUnit"	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Tie-Point Geo Coordinate Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	timeCoordinatesData	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tieGeoCoordinatesData”	1
	contentUnit						1
		ID		Content unit ID	S	"tieGeometriesUnit"	0..1

Name				Description	Data Type	Value	Occ.
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Tie-Point Geometries Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	tieGeoCoordinatesData timeCoordinatesData	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"tieGeometriesData"	1
	contentUnit						1
		ID		Content unit ID	S	tieMeteoUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Tie-Point Meteo Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	tieGeoCoordinatesData timeCoordinatesData	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tieMeteoData”	1
	contentUnit						1
		ID		Content unit ID	S	timeCoordinatesUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Time Coordinates Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“timeCoordinatesData”	1
	contentUnit						1
		ID		Content unit ID	S	instrumentDataUnit	0..1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Instrument Annotation”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “qualityFlagsData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“instrumentDataData”	1

5.1.2 "ME_2_FRG___/ME_2_RRG___" Level 2 Products

The Information Package Map associated to the package of the ME_2_FRG___/ME_2_RRG___ products is reported in the next table.

Table 5-2: Information Package Map for L2 MERIS products

Name				Description	Data Type	Value	Occ.
contentUnit				The information package map contains one content unit that includes the product data component included in the product.	Content Unit Type		1
	ID			Identifier of the package	S	"packageUnit"	0..1
	unitType			Describes the type of data referenced by this content unit	S	"Information Package"	0..1
	textInfo			Textual description of the content unit	S	"ENVISAT MERIS Level 2 Product"	0..1
	pdiID			Identifier of the Preservation Description Information applicable to this content unit	S	"processing"	1
	dmdID			Identifier of the Metadata applicable to this content unit	S	In any order : "acquisitionPeriod" " platform" "orbitReference" "qualityInformation" "processing" "frameSet" "generalProductInformation" "merisProductInformation"	1
	contentUnit						1..14
		ID		Content unit ID	S	Mxx_rho_yyUnit xx = 01, …, 10, 12, 13, 14 yy = w, top, TOA	1
		unitType			S	"Measurement Data Unit"	1
		textInfo			S	Reflectance for MERIS acquisition band Mxx xx = 01, …, 10, 12, 13, 14	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: 'geoCoordinatesData' 'timeCoordinatesData' "commonFlagsData" "wqsfData" for rho_w "lqsfData" for rho_top "cqsfData" for rho_TOA	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"Mxx_rho_yyData", xx = 01, …, 10, 12, 13, 14 yy = w, top, TOA	1
	contentUnit						0..1
		ID		Content unit ID	S	chlOc4meUnit	1

Name				Description	Data Type	Value	Occ.
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“OC4Me algorithm Chlorophyll concentration"	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“chlOc4meData”	1
	contentUnit						0..1
		ID		Content unit ID	S	chlNnUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Neural Net Chlorophyll concentration”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“chlNnData”	1
	contentUnit						0..1
		ID		Content unit ID	S	tsmNnUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Total suspended matter concentration”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tsmNnData”	1
	contentUnit						0..1
		ID		Content unit ID	S	trspUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Transparency properties of water”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“trspData”	1
	contentUnit						0..1
		ID		Content unit ID	S	iopNnUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Inherent Optical Properties	0..1

Name				Description	Data Type	Value	Occ.
						of water”	
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“iopNnData”	1
	contentUnit						0..1
		ID		Content unit ID	S	parUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Photosynthetically Active Radiation”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“parData”	1
	contentUnit						0..1
		ID		Content unit ID	S	wAerUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Aerosol Over Water”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “wqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“wAerData”	1
	contentUnit						0..1
		ID		Content unit ID	S	lAerUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Aerosol Over Land”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “lqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“lAerData”	1
	contentUnit						0..1
		ID		Content unit ID	S	psurfUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Surface pressure”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData”	0..1

Name				Description	Data Type	Value	Occ.
						"lqsfData"	
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"psurfData"	1
	contentUnit						0..16
		ID		Content unit ID	S	mgviUnit	1
		unitType			S	"Measurement Data Unit"	1
		textInfo			S	MERIS global Vegetation Index	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: 'geoCoordinatesData' 'timeCoordinatesData' "commonFlagsData" "lqsfData"	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	mgviData	1
	contentUnit						0..1
		ID		Content unit ID	S	mtciUnit	1
		unitType			S	"Measurement Data Unit"	1
		textInfo			S	"MERIS Terrestrial Chlorophyll Index"	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: 'geoCoordinatesData' 'timeCoordinatesData' "commonFlagsData" "lqsfData"	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"mtciData"	1
	contentUnit						0..1
		ID		Content unit ID	S	rcMgviUnit	1
		unitType			S	"Annotation Data Unit"	1
		textInfo			S	"Rectified Reflectance"	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: 'geoCoordinatesData' 'timeCoordinatesData' "commonFlagsData" "lqsfData"	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	"rcMgviData"	1
	contentUnit						0..1
		ID		Content unit ID	S	iwvUnit	1
		unitType			S	"Measurement Data Unit"	1
		textInfo			S	"Integrated water vapour column"	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: 'geoCoordinatesData' 'timeCoordinatesData' "commonFlagsData" "wqsfData" "lqsfData"	0..1

Name				Description	Data Type	Value	Occ.
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“iwvData”	1
	contentUnit						0..1
		ID		Content unit ID	S	calbUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Cloud albedo, optical thickness and type”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “cqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“calbData”	1
	contentUnit						0..1
		ID		Content unit ID	S	ctpUnit	1
		unitType			S	“Measurement Data Unit”	1
		textInfo			S	“Cloud top pressure”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’ “commonFlagsData” “cqsfData”	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“ctpData”	1
	contentUnit						0..1
		ID		Content unit ID	S	commonFlagsUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Common Flags”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“commonFlagsData”	1
	contentUnit						0..1
		ID		Content unit ID	S	wqsfUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Water Quality and Science Flags”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“wqsfData”	1

Name				Description	Data Type	Value	Occ.
	contentUnit						0..1
		ID		Content unit ID	S	cqsfUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Cloud Quality and Science Flags”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“cqsfData”	1
		ID		Content unit ID	S	cqsfUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Cloud Quality and Science Flags”	0..1
		dmdID		Attribute: Description Metadata Identifier	S	In any order: ‘geoCoordinatesData’ ‘timeCoordinatesData’	0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“cqsfData”	1
	contentUnit						1
		ID		Content unit ID	S	geoCoordinatesUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Geo Coordinates Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“geoCoordinatesData”	1
	contentUnit						1
		ID		Content unit ID	S	tieGeoCoordinatesUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Tie-Point Geo Coordinate Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tieGeoCoordinatesData”	1
	contentUnit						1
		ID		Content unit ID	S	tieGeometriesUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Tie-Point Geometries Annotations”	0..1
		dmdID		Attribute: Description	S		0..1

Name				Description	Data Type	Value	Occ.
				Metadata Identifier			
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tieGeometriesData”	1
	contentUnit						1
		ID		Content unit ID	S	tieMeteoUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Tie-Point Meteo Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“tieMeteoData”	1
	contentUnit						1
		ID		Content unit ID	S	timeCoordinatesUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Time Coordinates Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“timeCoordinatesData”	1
	contentUnit						1
		ID		Content unit ID	S	instrumentDataUnit	1
		unitType			S	“Annotation Data Unit”	1
		textInfo			S	“Instrument Annotations”	0..1
		dmdID		Attribute: Description Metadata Identifier	S		0..1
		dataObjectPointer					1
			ID	Data Object pointer ID	S		0..1
			dataObjectID	Data Object element ID	S	“instrumentDataData”	1

5.2 Metadata Section

See [AD- 2] for the metadata general description.

5.3 Data Object Section

The data object section of the manifest includes one data object per data object pointer. Each data object pointer is identified with its dataObjectID as defined in the information package map in section 5.1.

5.3.1 Measurement Data File

5.3.1.1 "ME_1_FRG/ME_1_RRG" Level 1 Product

Data Objects for the MERIS ME_1_FRG and ME_1_RRG Level 1 products are listed in the next table.

Table 5-3: ME_1_FRG/ME_1_RRG Level 1 measurements Data Objects

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"Mxx_radianceData" xx = 01, 02,…, 15
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"Mxx_radiance.nc" xx = 01, 02,…, 15
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

5.3.1.2 "ME_2_FRG/ME_2_RRG" Level 1 Product

Data Objects for MERIS ME_2_FRG and ME_2_RRG Level 2 products are listed in the next table.

Table 5-4: ME_2_FRG/ME_2_RRG Level 2 Data Objects

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"Mxx_rho_yyData", xx = 01, …, 10, 12, 13, 14 yy = w, top, TOA
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"Mxx_rho_yy.nc", xx = 01, …, 10, 12, 13, 14 yy = w, top, TOA
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	

Name				Description	Data type	Occ.	Value
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	chlOc4meData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"chl_oc4me.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	chlNnData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the	S		"chl_nn.nc"

Name				Description	Data type	Occ.	Value
				referenced Data Component			
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	tsmNnData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"tsm_nn.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	trspData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"

Name				Description	Data type	Occ.	Value
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"trsp.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	iopNnData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"iop_nn.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	parData

Name				Description	Data type	Occ.	Value
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"par.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	wAerData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"w_aer.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	

Name				Description	Data type	Occ.	Value
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	lAerData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"l_aer.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	psurfData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL

Name				Description	Data type	Occ.	Value
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"psurf.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	iwvData
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"iwv.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"mgviData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	

Name				Description	Data type	Occ.	Value
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		Size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"mgvi.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		Checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"mtciData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		Size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"mtci.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		Checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"calbData"

Name				Description	Data type	Occ.	Value
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		Size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"cloud.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		Checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5
Data Object				This element references the Data Component included in the L1 product.	U	1..*	
	ID			Data Component ID	S	1	"ctpData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		Size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"ctp.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		Checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

5.3.2 Annotation Data File

Each Annotations Data File constitutes a Data Object composed as follows:

Table 5-5: Time coordinates Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"timeCoordinatesData"
	byte Stream			Pointer to the data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"time_coordinates.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-6: Geo-coordinates Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"geoCoordinatesData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"geo_coordinates.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-7: Quality flags Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	“qualityFlagsData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf”
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“qualityFlags.nc”
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-8: Tie geo-coordinates Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	“tieGeoCoordinatesData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf”
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“tie_geo_coordinates.nc”
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-9: Tie geometries Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"tieGeometriesData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"tie_geometries.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-10: Tie meteo Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"tieMeteoData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"tie_meteo.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-11: Instrument data Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"instrumentDataData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"instrument_data.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-12: Wqsf Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	“wqsfData”
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf”
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		“wqsf.nc”
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-13: Lqsf Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"lqsfData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"lqsf.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-14: Cqsf Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"cqsfData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"cqsf.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-15: Common Flags Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"commonFlagsData"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/x-netcdf"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the Data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		"common_flags.nc"
			textInfo	Textual description of the Data Component	S	0..1	
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

Table 5-16: OLQC annotation Metadata Object

Name				Description	Data type	Occ.	Value
Data Object				This element references the Data Component included in the product.	U	1..*	
	ID			Data Component ID	S	1	"OLQCReport"
	byte Stream			Pointer to the Data Component	U	1..*	
		ID		Byte stream ID	S	0..1	
		mimeType		MIME type for the referenced Data Component	E	1	"application/octetstream"
		size		Size of the Data Object File	L	1	
		fileLocation		Description of the location of the data component file	U	1	
			locator Type	Type of the file location	URL	0..1	URL
			href	Relative path of the file (in the file system) containing the referenced Data Component	S		TBD
			textInfo	Textual description of the Data Component	S	0..1	"On Line Quality Control Report"
		checksum		Checksum for the Data Component	U	1	
			checksumName		E	1	MD5

6 XML SCHEMA

The xml schemas used to generate the product manifest are provided as separate files (see AD- 6).

7 PRODUCT SIZE

In the following table the approximate size of each MERIS file composing the Level 1 and Level 2 products is given.

The sizes computation have been based on a MERIS reduced resolution (RR) orbit which corresponds approximately to 15 000 frames.

MERIS full resolution (FR) sizes could be extrapolated from RR ones by applying a factor 16 (because FR products dimensions are 4 times bigger than RR).

No file compression is applied.

7.1 MERIS Level 1

Tie points related figures account for an along-track spacing of 1 to be compliant with driver [OPCONF-1] of the Driver TN document. The size of the radiances includes the 21 bands and the associated radiance error.

Table 7-1: ME_1_RRG___ product size

Element name	Description	Size in RR mode in GBytes
xfdumanifest.xml	Sentinel-SAFE product manifest	
M##_radiance.nc	Radiance for MERIS acquisition bands 01 to 15	1,1
time_coordinates.nc	Time stamp annotations	0,00013
geo_coordinates.nc	High resolution georeferencing data	0,18
qualityFlags.nc	Classification and quality flags	0,072
tie_geo_coordinates.nc	Low resolution georeferencing data	0,00064
tie_geometries.nc	Sun and View angles	0,0011
tie_meteo.nc	ECMWF meteorology data	0,012
instrument_data.nc	Instrument data	0,036
	Total	1,4

The total size of the radiance errors (21 bands) is: 11.71 GBytes in FR mode and 0.714 GBytes in RR.

7.2 MERIS Level 2

Table 7-2: ME_2_RRG___ product size

Element name	Description	Size in RR mode in GBytes
xfdumanifest.xml	Sentinel-SAFE product manifest	
M##_rho_w.nc	Water-leaving reflectance for MERIS acquisition bands, excluding absorption bands (M11 and M15)	0,93
M##_rho_top.nc	Land surface reflectance for MERIS acquisition bands, excluding absorption bands (M11 and M15)	0,93
M##_rho_TOA.nc	TOA reflectance for MERIS acquisition bands, excluding absorption bands (M11 and M15)	0,93
chl_oc4me.nc	Chlorophyll concentration calculated according to the OC4Me algorithm	0,036
chl_nn.nc	Chlorophyll concentration calculated according to the NN algorithm	0,036
tsm_nn.nc	Total suspend matter	0,036
trsp.nc	Transparency properties of water	0,036
iop_nn.nc	Inherent Optical Properties of water	0,036
par.nc	Photosynthetic Activer Radiation	0,036
w_aer.nc	Aerosol Over Water	0,072
l_aer.nc	Aerosol Over Land	0,090
psurf.nc	Surface Pressure	0,019
mgvi.nc	MERIS Global Vegetation Index	0,036
mtci.nc	MERIS Terrestrial Chlorophyll Index	0,055
cloud.nc	Cloud albedo, optical thickness and type	0,055
ctp.nc	Cloud Top Pressure	0,019
iwv.nc	Integrated water vapour column	0,036
rc_mgvi.nc	Rectified Reflectance	0,072
time_coordinates.nc	Time stamp annotations	0,00013

Element name	Description	Size in RR mode in GBytes
geo_coordinates.nc	High resolution georeferencing data	0,18
common_flags.nc	Common Flags	0,13
wqsf.nc	Water Quality and Science Flags	0,18
lqsf.nc	Land Quality and Science Flags	0,072
cqsf.nc	Cloud Quality and Science Flags	0,036
tie_geo_coordinates.nc	Low resolution georeferencing data	0,00064
tie_geometries.nc	Sun and View angles	0,0011
tie_meteo.nc	ECMWF meteorology data	0,012
instrument_data.nc	Instrument data	0,036
	Total	4,2

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