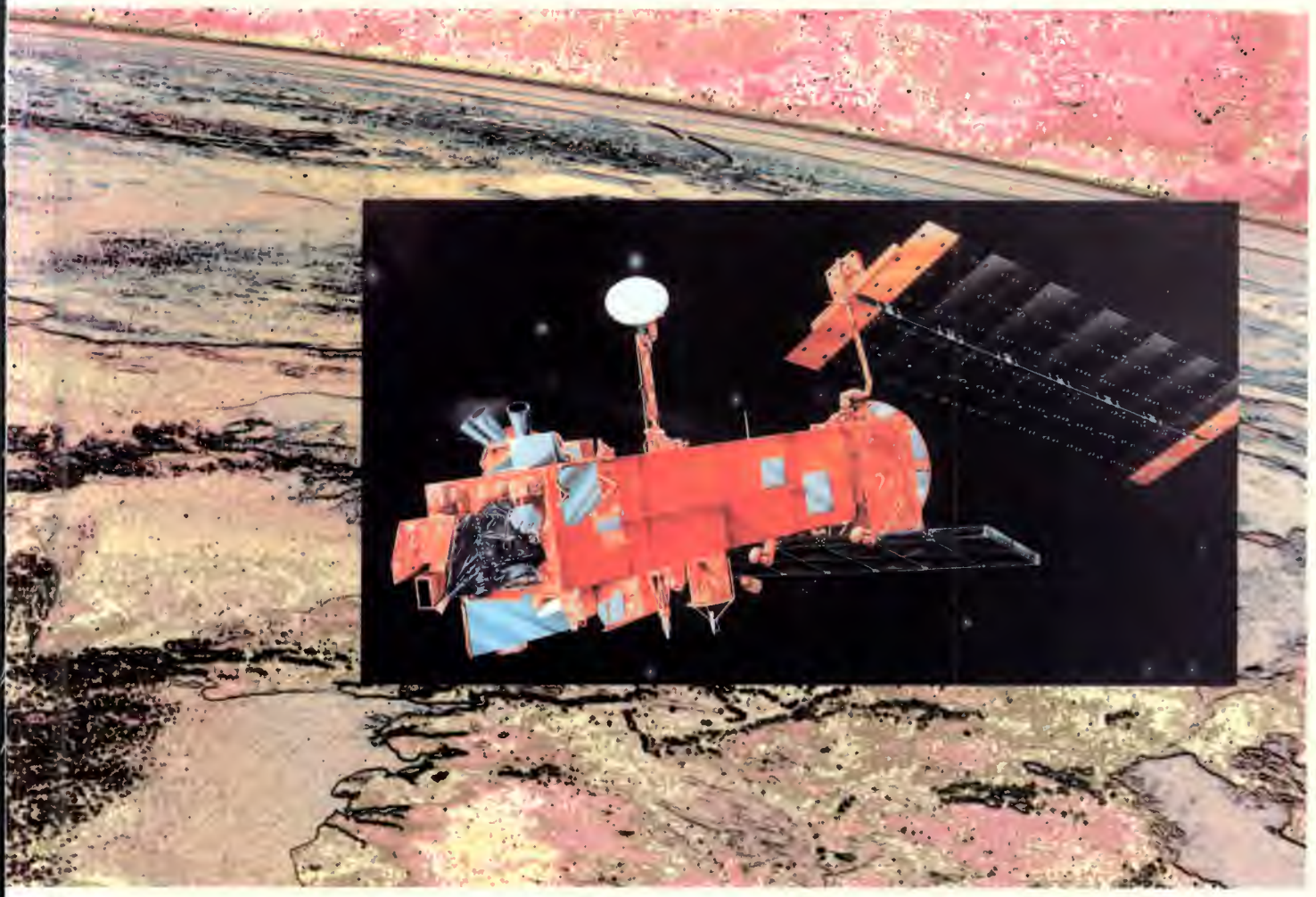
SP-1221
March 1998

Envisat Mission



Product Summary Overview

European Space Agency
Agence spatiale européenne

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Envisat Mission

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Published by: ESA Publications Division
ESTEC, Keplerlaan 1
2200 AG Noordwijk
The Netherlands
Editor: Bob Harris

Price: 50 Dutch Guilders

ISBN No: 92-9092-480-2
Printed in: The Netherlands

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CHANGE RECORD

Issue /Rev	Date	Page	Description of Changes
1.0	18/12/97		First issue in support of the Announcement of Opportunity This document is based on the ESA document: PO-TN-ESA-GS-00231
2.0	27/02/98		Editing of the issue 1.0 for publication as SP-1221. Addition of the generation of the RA-2 Wind/wave product (RA2_WWV_2P) also by F-PAC (three days after data sensing) along with the IGDR product (RA2_MWG_2P, flag P).

1 INTRODUCTION

1.1 SCOPE

The scope of this document is to give an overview of all the ESA ENVISAT products.

1.2 RELATION TO OTHER DOCUMENTS

[A-1] gives the general rules applicable to the format of all ENVISAT products.

The present document describes the list of the products and their summary content.

The detailed specifications of the products are given in [A-2].

The detailed specifications of the Instrument Source Packets (ISP) are given in [A-3].

1.3 APPLICABLE DOCUMENTS

[A - 1]	PO-TN-ESA-GS-0242	ENVISAT Product Format Guidelines
[A - 2]	PO-RS-MDA-GS-2009	ENVISAT Product Specification
[A - 3]	PO-ID-DOR-SY-0032	Payload to Ground Segment ICD (PGICD)

1.4 ACRONYMS

ANX = Ascending Node Crossing
ASAR GP = ASAR Generic Processor
AP = Alternating Polarisation
bps = bits per second
CIA WDB2 = CIA World Data Base 2
CTDP = Centre Traitement DORIS Poseidon
DB= Direct Broadcast
DCW = Digital Chart of the World
DRS = Data Relay Satellite
DSR = Data Set Record
ECMWF = European Centre for Medium Weather Forecast
FD = Fast Delivery
FPAR = fractional photosynthetically active radiation
FR = Full Resolution
GM = Global Monitoring (Mode)
I/F=interface
IM = Image Mode
I/O=Input/Output
ISP = Instrument Source Packets
kbps = kilo bits per second
LRAC = Low Rate Archive Centre
LVI = Land Vegetation Index
LR= Low Rate
Mbps = Mega bit per second
MB= Mega Bytes
MJD = Modified Julian Day
MPH = Main Product Header
MR= medium resolution
NDVI = Normalised Differential Vegetation Index
NRT = Near Real Time
NS= Narrow Swath
OGRC= On Ground Range Compressed
PAC = Processing and Archiving Centre
PCD = Product Confidence Data
PDS = Payload Data Segment
PDHS = Payload Data Handling Centre
PDHS-E = Payload Data Handling Centre ESRIN
PDHS-K = Payload Data Handling Centre KIRUNA
RR = Reduced Resolution
SPH = Specific Product Header
TBD = To Be Defined
TBC = To Be Confirmed
TOA= Top Of Atmosphere radiance
WS = Wide Swath

2 ASAR

2.1 ASAR Product Summary Table

ASAR	Processing Level	Image	Alternating Polarization	Wide Swath	Global Monitoring	Wave
L 0	**level0** stripe size Coverage	ASA_IM__0P 22500 MB 100 km / 12000 km (30')	ASA_APC_0P ASA_APH_0P ASA_APV_0P 22500 MB 100 km / 12000 km (30')	ASA_WS__0P 22500 MB 400 km / 12000 km (30')	ASA_GM__0P 675 MB 400 km / 40000 km (1 orbit)	ASA_WV__0P 608 MB 400 * 5 km * 5 km (1 orbit)
Browse	**Browse** stripe size Coverage:	ASA_IM__BP 3 MB 100 km / 4000 km	ASA_AP__BP 3 MB 100 km / 4000 km	ASA_WS__BP 3 MB 400 km / 4000 km	ASA_GM__BP 18 MB 400 km / 40000 km	
L 1b	**Med. Res. Image** size scene Coverage:	ASA_IMM_1P 4 MB 100 km / 100 km	ASA_APM_1P 4 MB 100 km / 100 km	ASA_WSM_1P 59 MB 400 km * 400 km		
L 1b	**Glob.Mon. Image** size orbit Coverage				ASA_GM1_1P 146 MB 400 km / 40000 km	
L 1b	**SLC** size scene Coverage	ASA_IMS_1P 741 MB per scene 100 km / 100 km	ASA_APS_1P 1481 MB per scene 100 km / 100 km			
L 1b	**PRI** size scene Coverage	ASA_IMP_1P 134 MB per scene 100 km / 100 km	ASA_APP_1P 268 MB per scene 100 km / 100 km			
L 1b	**GEC** size scene Coverage	ASA_IMG_1P 282 MB 100 km / 100 km	ASA_APG_1P 563 MB 100 km / 100 km			
L 1b	**Spectra & SLC Imagette** size Coverage					ASA_WVI_1P 120 MB (20 imagettes) 5 km * 5 km
L 1b	**Image Spectra** size					ASA_ WVS_1P 0.2 MB (20 spectra)
L 2	**Wave spectra** size					ASA_WVW_2P 0.2 MB (20 spectra)

ASAR	Processing Level	External Characterisation	Module Stepping
L 0	**level0** size Coverage	ASA_EC__0P 6.25 MB In transponder Visibility (data transmission in 0.5 sec.)	ASA_MS__0P 1 MB not applicable

2.2 ASAR Product Spreadsheets

PRODUCT ID	ASA_IM__0P
NAME	ASAR Image Mode source packets level 0
DESCRIPTION	ASAR Level 0 data of image mode The objective of this product is to offer Level 0 data for possible images processing on other processing sites. It includes some mandatory information for SAR processing
COVERAGE RESOLUTION ACCURACY SIZE	Image mode,: 56 - 100 km across track depending on subswath. Along track coverage depends on the requested time interval (30 min max) N/A N/A Depends on the acquired segment : 22500 MB max (30' of data)
DATASET	MPH + SPH + MDS MDS containing annotated ISP (1) sample = 4 bits I, 4 bits Q (compressed)
AUXILIARY DATA	Orbit data and time correlation parameters,PCD are included. (Noise Measurements, Calibration Pulses P1,P1a,P2,P3 Header content of Source Packet)
NOTES	1. Data uncompression is the first step to level1 processing

PRODUCT ID	ASA_APH__0P ASA_APV__0P ASA_APC__0P
NAME	ASAR Alternating Polarisation Mode source packets level 0
DESCRIPTION	ASAR Level 0 data of alternating polarization mode. Three sub-modes are existing for this mode: • cross pol H (HH/HV= H transmit H and V received) • cross pol V(VV/VH= V transmit V and H received) • copol C (HH/VV= H and H received/V transmit and V received) The objective of this product is to offer Level 0 data for possible images processing on other processing site. It includes mandatory information for SAR processing
COVERAGE	Alternating Polarization mode: 56 - 100 km across track depending on subswath. Along track coverage depends on the requested time interval.
RESOLUTION	N/A
ACCURACY	N/A
SIZE	Depends on the acquired segment : 22500 MB (30' of data)
DATASET	MPH + SPH + MDS MDS containing annotated ISP (1) sample = 4 bits I, 4 bits Q (compressed)
AUXILIARY DATA	Orbit data and time correlation parameters, PCD are included. (Noise Measurements, Calibration Pulses P1, P1a, P2, P3 Header content of Source Packet)
NOTES	1. Data uncompression is the first step to level 1 processing

PRODUCT ID	ASA_WS__0P
NAME	ASAR Wide Swath Mode source packets level 0
DESCRIPTION	ASAR Level 0 wide swath mode. The objective of this product is to offer Level 0 data for possible images processing on other processing site. It includes mandatory information for SAR processing
COVERAGE	Wide swath mode: 406 km across track. Along track coverage depends on the requested time interval.
RESOLUTION	N/A
ACCURACY	N/A
SIZE	Depends on the acquired segment : 22500 MB (30' of data)
DATASET	MPH + SPH + MDS MDS containing annotated ISP (1) sample = 4 bits I, 4 bits Q (compressed)
AUXILIARY DATA	Orbit data and time correlation parameters, PCD are included. (Noise Measurements, Calibration Pulses P1, P1a, P2, P3 Header content of Source Packet)
NOTES	1. Data uncompression is the first step to level 1b processing

PRODUCT ID	ASA_IMP_1P
NAME	ASAR image mode Precision Image
DESCRIPTION	This is a multi-look, ground range, digital image. Generated from Level 0 data collected when the instrument is in image mode (7 possible swaths HH or VV polarisation). The product includes slant range to ground range correction as per definition. It is for users wishing to perform applications-oriented analysis. It is intended for multi-temporal imaging and to derive backscattering coefficients.
COVERAGE	100 km along track * 56- 100 km across track
GEOMETRIC RESOLUTION	approximately 30 m ground range (except IS1) * 30 m azimuth
RADIOMETRIC RESOLUTION	Product ENL > 3
PIXEL SPACING	12.5 m * 12.5 m
SIZE	up to 134 MB
DATASET	each product containing the following: (1) header MPH + SPH (2) 8000 data records (3) 8350 samples/record (size for IS1 swath) (4) 2 bytes/sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration: 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. Product size in the range direction will vary as a function of imaging swath. 2. Corrections: antenna elevation pattern, range spreading loss.

PRODUCT ID	ASA_IMS_1P
NAME	ASAR image single look complex
DESCRIPTION	This is a single-look, complex, slant-range, digital image generated from Level 0 ASAR data collected when the instrument is in image mode (7 possible swaths HH or VV polarisation). It is primarily intended for use in SAR quality assessment and calibration, and can be used to derive higher level products.
COVERAGE	100 km along track * 56-100 km across track
GEOMETRIC RESOLUTION	approximately 6 azimuth, programmed chirp bandwidth dependent slant range.
RADIOMETRIC RESOLUTION	1 look in azimuth, 1 look in range
PIXEL SPACING	natural spacing in both Slant range and Azimuth
SIZE	741 MB
DATASET	each product containing the following: (1) headers MPH + SPH (2) max 27 000 data records(TBC) (3) max 6850 samples/record (depending on imaging swath) (4) 4 bytes/sample (2bytes I/ 2bytes Q)
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. Azimuth pixel spacing depends on Earth-Satellite relative velocity and actual PRF. 2. Slant range pixel spacing is given by ASAR sampling frequency (19.208 MHz)

PRODUCT ID	ASA_IMG_1P
NAME	ASAR image mode ellipsoid geocoded image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in image mode. It is the geocoded version of the PRI product. The product is resampled to a map projection and its orientation is north up.
COVERAGE	100 km * 100 km (corresponding to the input data)
RADIOMETRIC RESOLUTION	Product ENL > 3
GEOMETRIC RESOLUTION	approximately 30 m ground range (except IS1) * 30 m azimuth
PIXEL SPACING	12.5 m * 12.5 m (grid easting and northing)
SIZE	up to 282 MB
DATASET	each product containing the following: (1) header MPH + SPH (2) max 11850 records (3) max 11850 samples/record (4) 2 bytes / sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration: 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1 Product size will vary function of imaging swath position. 2. The absolute calibration of the GEC product shall be the same as for the corresponding non-geocoded PRI product.

PRODUCT ID	ASA_APP_1P
NAME	ASAR alternating polarization precision image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in alternating polarization mode (7 possible swaths). The product contains two images corresponding to one of the three polarisation combination sub-modes (HH & VV, HH & HV, VV & VH)
COVERAGE	100 km along track, 56-100 km across track
GEOMETRIC RESOLUTION	approximately 30 m ground range (except IS1) * 30 m azimuth
RADIOMETRIC RESOLUTION	Product ENL > 1.8
PIXEL SPACING	12.5 m * 12.5 m
SIZE	up to 268 MB
DATASET	each product containing the following: (1) header MPH + SPH (2) 16000 data records (8000 for VV polarisation & 8000 for HH polarisation) (3) 8350 samples/record (depending on imaging swath) (4) 2 bytes/sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. Product size in the range direction will vary function of imaging swath (56 to 100 km) 2. The images from the two polarisation channels are coregistered. 3. Corrections: antenna elevation pattern, range spreading loss.

PRODUCT ID	ASA_APG_1P
NAME	ASAR Alternating Polarisation mode ellipsoid geocoded image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in alternating polarisation mode. It is the geocoded version of ASAR_AP. The product is resampled to a map projection and its orientation is north up. The product contains two images corresponding to one of the three polarisation combination sub-modes (HH & VV, HH & HV, VV & VH)
COVERAGE	100 km * 100 km
GEOMETRIC RESOLUTION	approximately 30 m ground range (except IS1) * 30 m azimuth
RADIOMETRIC RESOLUTION	Product ENL > 1.8
PIXEL SPACING	12.5 m * 12.5 m (grid easting and northing)
SIZE	up to 563 MB
DATASET	(1) each product containing the following (2) header MPH + SPH (3) max 23 700 records (11850 for VV polarisation & 11850 for HH polarisation) (4) max 11850 samples/record (depending on imaging swath) (5) 2 bytes / sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration: 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. Product size will vary function of imaging swath position. 2. The absolute calibration of the GEC product shall be the same as for the corresponding non-geocoded PRI product. 3. The images from the two polarisation combination channels are coregistered.

PRODUCT ID	ASA_APS_1P
NAME	ASAR Alternating Polarisation mode complex image
DESCRIPTION	This is a complex, slant-range, digital image generated from Level 0 ASAR data collected when the instrument is in Alternating Polarisation mode (7 possible swaths). It is primarily intended for use in SAR quality assessment and calibration, and can be used to derive higher level products. If allowed by the instrument acquisition, this product shall be suitable for interferometric applications. The product contains two images corresponding to one of the three polarisation combination sub-modes (HH & VV, HH & HV, VV & VH)
COVERAGE	100 km along track, 56-100 km across track
GEOMETRIC RESOLUTION	approximately TBD azimuth, TBD slant range.
RADIOMETRIC RESOLUTION	1 look in azimuth, 1 look in range
PIXEL SPACING	natural spacing in both Slant range and Azimuth
SIZE	max 1480 MB
DATASET	each product containing the following (1) headers MPH + SPH and respectively for each polarisation (2) max 27 000 data records (3) 6850 samples/record (depending on imaging swath) (4) 4 bytes/sample (2bytes I / 2bytes Q)
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. Product size will vary function of imaging swath, satellite velocity and actual PRF. 2. The images from the two polarisation channels are coregistered.

PRODUCT ID	ASA_WSM_1P
NAME	ASAR wide swath standard image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in wide swath mode. The product includes slant range to ground range corrections per definition. The product covers a continuous area along the imaging swath.
COVERAGE	400 km * 400 km (approximately) for a scene 400 km * 4000 km max for a stripe
GEOMETRIC RESOLUTION	approximately 150 m * 150 m
RADIOMETRIC RESOLUTION	Product ENL > 11.5
PIXEL SPACING	75 m * 75 m
SIZE	59 MB for a scene 584 MB for a stripe
DATASET	each product scene containing the following: (1) header MPH + SPH (2) 5400 data records (3) 5450 samples/record (4) 2 bytes/sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	

PRODUCT ID	ASA_IMM_1P
NAME	ASAR image mode medium resolution image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in image mode. This product has lower resolution but higher radiometric resolution than the ASA_IMP. The product covers a continuous area along the imaging swath
COVERAGE	100 km in along track direction for a scene up to 4000 km for a stripe, 56-100 km in across track direction
GEOMETRIC RESOLUTION	approximately 150 m * 150 m
RADIOMETRIC RESOLUTION	Product ENL ~ 40
PIXEL SPACING	75 m * 75 m
SIZE	4 MB of data for a scene 152 MB for a stripe
DATASET	each product scene containing the following: (1) header MPH + SPH (2) 1400 data records (3) 1400 samples/record (4) 2 bytes/sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. The products cover a continuous area along the imaging swath.

PRODUCT ID	ASA_APM_1P
NAME	ASAR Alternating Polarization medium resolution image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in alternating polarization mode. The product has lower geometric resolution but higher radiometric resolution than ASA_APP The product contains one or two images corresponding to one of the three polarisation combination sub-modes (HH & VV, HH & HV, VV & VH)
COVERAGE	100 km in along track direction for a scene/ up to 4000 km for a stripe, 56-100 km in across track direction
GEOMETRIC RESOLUTION	approximately 150 m * 150 m
RADIOMETRIC RESOLUTION	Product ENL ~ 50
PIXEL SPACING	75 m * 75 m
SIZE	4 MB for a scene with one polarisation combination
DATASET	each product containing for each polarisation: (1) header MPH + SPH (2) 1400 data records (3) 1400 samples/record (4) 2 bytes/sample
AUXILIARY DATA	Orbit state vector . Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. The products cover a continuous area along the imaging swath. 2 The images from the two polarisation channels are coregistered.

PRODUCT ID	ASA_WV__0P
NAME	ASAR wave mode Low rate level 0
DESCRIPTION	ASAR Level 0 source packet of wave mode. The objective of this product is to offer Level 0 Source Packet data for possible images processing on other processing site.It includes mandatory information for SAR processing.
COVERAGE	up to 100% of the orbit (from 6.04 km * 5 km imagette in IS7 to 9.44 km * 5 km Imagette in IS1 depending on swath selection) every 100 km
RESOLUTION	N/A
ACCURACY	N/ A
SIZE	max 608 MB/orbit
DATASET	MPH + SPH + ISP sample = 2 bits I, bits 2 Q (compressed using the FBAQ))
AUXILIARY DATA	Orbit data and time correlation parameters are included. PCD (Noise Measurements, Calibration Pulses P1, P1a, P2, P3 Header content of Source Packet)
NOTES	(1) product size derived from IS7 = 1.52 MB (TBC) (reference PO-LI-MMS-SR-0002 Instrument data list) up to 400 imagettes/products

PRODUCT ID	ASA_WVI_1P
NAME	ASAR Wave Mode SLC imagette and Imagette Cross Spectra
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in wave mode. The product is the basic level 1B product of ASAR wave mode. The information is retained in complex form to allow derivation of Cross spectra. Product containing up to 20 imagettes and associated imagettes cross spectra.
COVERAGE	one product per 20 imagettes with imagette of 5 km * 5 km (min.) every 100 km
GEOMETRIC RESOLUTION	natural spacing slant range and azimuth azimuth wavelength range from 20 to 1000 m in 24 logarithmic steps direction 0-360 degrees in 10 degree steps (only half real part and imaginary part of spectra in product)
RADIOMETRIC RESOLUTION	1 look in azimuth, 1 look in range for the SLC imagette
PIXEL SPACING	natural pixel spacing in range and azimuth note 1-2
SIZE	max 120 MB (20 imagettes and spectra)
DATASET	MPH + SPH + Data Set Record A 20 Polar Spectrum (18 bins in direction * 24 bins in wavelength * 2 bytes per bin) + Data Set Record B 1 imagette max 1350 data records * 1100 samples/record * 4 bytes/sample (2 bytes I/ 2 bytes Q)
AUXILARY DATA	Orbit state vector. Time correlation parameters. Wave Processing parameters ADS, Wave Geolocation ADS, SQ ADS
NOTES	1 Azimuth pixel spacing depends on Earth-Satellite relative velocity and actual PRF. 2 Slant range pixel spacing is given by ASAR sampling frequency (19.208 MHz)

NOTE: The product called ASAR_WVW_2P is the level 2 product of ASAR wave mode derived using the cross spectra methodology.

PRODUCT ID	ASA_WVS_1P
NAME	ASAR Wave Mode Imagette Cross Spectra
DESCRIPTION	ASAR Cross Spectra extracted from the combined SLC and Cross Specta product ASA_WVI_1P generated from data collected when the instrument is in wave mode using the Cross Spectra methodology. The Product is for Meteo users.
COVERAGE	up to 20 spectra acquired every 100 km, product coverage 5 km * 5 km minimum
GEOMETRIC RESOLUTION	wavelength range from 20 to 1000 m in 24 logarithmic steps direction 0-360 degrees in 10 degree steps (only half real part and imaginary part of spectra in product)
PIXEL SPACING	N/A
SIZE	max 0.2 MB
DATASET	MPH + SPH 20 Polar Spectrum [18 bins in direction (10 deg steps) * 24 bins in wavelength * 2 bytes per bin]
AUXILIARY DATA	Orbit state vector. Time correlation parameters. Wave Processing parameters ADS, Wave Geolocation ADS, SQ ADS

PRODUCT ID	ASAR_GM__0P
NAME	ASAR Global Monitoring Mode low rate Source Packet level 0
DESCRIPTION	ASAR Level 0 product annotated Instrument Source Packet collected while the instrument is in Global Monitoring Mode. The objective of this product is to offer Level 0 data for possible images processing on other processing site.It includes mandatory information for SAR processing.
COVERAGE	up to 100% of the orbit = 40 000 km * 400 km swath
RESOLUTION	N/A
ACCURACY	N/ A
SIZE	max 675 MB /orbit
DATASET	MPH + SPH + MDS MDS containing annotated ISP (1) sample = 4 bits I, 4 bits Q (compressed)
AUXILIARY DATA	Orbit data and time correlation parameters PCDs (Noise Measurements, Calibration Pulses P1, P1a, P2, P3 Header content of Source Packet)
NOTES	

PRODUCT ID	ASA_GM1_1P
NAME	ASAR Global Monitoring Mode Image
DESCRIPTION	ASAR product generated from Level 0 data collected when the instrument is in global monitoring mode. The product includes slant range to ground range correction.
COVERAGE	up to 40000 km (1 orbit) * 400 km (approximately)
GEOMETRIC RESOLUTION	1 km * 1 km
RADIOMETRIC RESOLUTION	Product ENL ~ 7-9
PIXEL SPACING	500 m * 500 m
SIZE	up to 146 MB/orbit extracted scene 2 MB
DATASET	each product containing the following: (1) header MPH + SPH (2) (up to 80000) data records (3) 850 samples/record (TBC) (4) 2 bytes/sample
AUXILIARY DATA	Orbit state vector. Time correlation parameters. Main Processing parameters ADS, Doppler Centroid ADS, Chirp ADS, Antenna Elevation Pattern ADS, SR/GR ADS, Geolocation Grid ADS, SQ ADS
INTERNAL CALIBRATION	For the purpose of calibration 1. Data I/Q correction (bias removal on both I and Q channels, I/Q channels gain imbalance correction, I/Q non orthogonality correction) 2. Replica construction 3. Calibration pulse processing 4. Elevation gain function calculation 5. Noise power estimation
NOTES	1. Stripline Processing one product covers a full orbit

PRODUCT ID	ASA_GM__BP
NAME	ASAR Global monitoring mode browse
DESCRIPTION	ASAR product generated from the ASA_GM1_1P when the instrument is in Global Monitoring mode. The product is for browse purpose only.
COVERAGE	405 km in across track direction product stripe up to 40000 km for GM
PIXEL SPACING	1000 m * 1000 m for GM
RADIOMETRIC RESOLUTION	Product ENL ~ 11-15
SIZE	Stripline max 18 MB
DATASET	each containing: (1) header (2) 40000 data records (3) 410 samples/record (4) 1 byte/sample
AUXILIARY DATA	Orbit state vector. Time correlation parameters. SQADS. Geolocation Grid ADS
NOTES	The products cover a continuous area along the imaging swath.

PRODUCT ID	ASA_IM__BP
NAME	ASAR image mode browse
DESCRIPTION	ASAR product generated when the instrument is in image mode. The product is for browse purpose only. The product is generated from ASA_IMM product.
COVERAGE	product stripe up to 4000 km 56-100 km in across track direction
RADIOMETRIC RESOLUTION	Product ENL ~ 80
PIXEL SPACING	225 m * 225 m (multiple of ASA_IMM pixel spacing)
SIZE	stripline max 3 MB
DATASET	each scene containing: (1) header (2) 8889 data records (3) 480 samples/record (4) 1 byte/sample
AUXILIARY DATA	Orbit state vector. Time correlation parameters. SQADS. Geolocation Grid ADS
NOTES	The products cover a continuous area along the imaging swath.

PRODUCT ID	ASA_AP__BP
NAME	ASAR alternating polarization browse
DESCRIPTION	ASAR product generated when the instrument is in alternating polarisation mode. The product is for browse purpose only. The product is generated from ASA_APM product. It contains one of the two possible polarisation combination generated in AP mode
COVERAGE	product stripe up to 4000 km 56-100 km in across track direction
RADIOMETRIC RESOLUTION	Product ENL ~ 75
PIXEL SPACING	225 m * 225 m (multiple of ASA_APM pixel spacing)
SIZE	stripline max 3 MB
DATASET	each scene containing: (1) header (2) 8889 data records (3) 480 samples/record (4) 1 byte/sample
AUXILIARY DATA	Orbit state vector. Time correlation parameters. SQADS. Geolocation Grid ADS
NOTES	The products cover a continuous area along the imaging swath.

PRODUCT ID	ASA_WS__BP
NAME	ASAR wide swath browse
DESCRIPTION	ASAR product generated when the instrument is in wide swath mode. The product is for browse purpose only.
COVERAGE	product stripe up to 4000 km 405 km in across track direction
RADIOMETRIC RESOLUTION	Product ENL ~ 30 to 48 (TBC)
PIXEL SPACING	900 m * 900 m for WS
SIZE	stripline max 3MB
DATASET	each product containing: (1) header (2) 4445 data records (3) 500 samples/record (4) 1 byte/sample
AUXILIARY DATA	Orbit state vector. Time correlation parameters. SQADS. Geolocation Grid ADS
NOTES	The products cover a continuous area along the imaging swath.

3 MERIS

Band Nr.	Band centre (nm)	Bandwidth (nm)	Main Applications
1	412.5	10	Yellow substance, Atmospheric correction (land)
2	442.5	10	Algal pigment Index, Atmospheric correction (land)
3	490	10	Algal pigment Index, Yellow substance, Vegetation
4	510	10	Algal pigment Index, Suspended sediment, Yellow sub.
5	560	10	Algal pigment Index, Suspended sediment, Yellow sub.
6	620	10	Suspended sediment
7	665	10	Atmospheric correction (land), Vegetation, fluorescence ref.
8	681.25	7.5	Chlorophyll fluorescence,
9	705	10	Atmospheric correction (ocean), fluorescence ref.
10	753.75	7.5	Oxygen absorption reference, Vegetation
11	760	2.5	Oxygen absorption R-branch
12	775	15	Atmospheric correction (ocean),
13	865	20	Atmospheric correction (ocean),
14	890	10	Water Vapour Absorption Reference, Vegetation
15	900	10	Water Vapour Absorption

MERIS nominal band setting

The MERIS band settings (channel wavelength and width) is selectable from ground by telecommand.

A different set of 15 spectral bands may be implemented for short periods upon users' request to support field campaigns and dedicated research projects. In these events, ESA will only make the Level 1b product available to users (no Level 2).

3.1 MERIS Product Summary Table

MERIS	Processing Level	**Reduced Resolution Mode** Scene Size MB COVERAGE	**Full Resolution Mode** Scene Size MB COVERAGE
Level 0	Annotated source packets	MER_RR__OP 522 MB for 43.5' per Orbit	MER_FR__OP 3600 MB for 20' per Orbit to PDHS-E 2250 MB for 12.5' per Orbit to PDHS-K
Level 0 Reduced Field of View	Annotated source packets		MER_RV__OP TBD
Level 0 Calibration	Annotated source packets		MER_CA__OP 492 Kb
Browse	RGB	MER_RR__BP 3.2 MB for 1150 km * 17500 km	
Level 1b	Geolocated and calibrated TOA Radiance (angles and auxiliary data appended)	MER_RR__1P 39 MB for 1150 km * 1150 km 532 MB for 1150 km * 17500 km	MER_FR__1P 157 MB for 575 km * 575 km for a complete set (Menu driven)
Reference Level 2	Geolocated ocean, atmosphere, land, geophysical parameters + normalized water leaving radiance (reflectance)	MER_RR__2P 48.5 MB for 1150 km * 1150 km 620 MB for 1150 km * 17500 km	MER_FR__2P 187 MB for 575 km * 575 km (Menu driven)
Atmosphere Level 2	Geolocated Cloud optical Thickness and Water Vapour Content	MER_RRC_2P 104 MB for 1150 km * 17500 km	
Vegetation Level 2	Geolocated Vegetation Index Including Atmospheric corrections	MER_RRV-2P 87 MB for 1150 km * 17500 km	
Low resolution Atmosphere Level 2	Geolocated Cloud optical Thickness and Water Vapour Content	MER_LRC_2P 8.7 MB for 1150 km * 17500 km	

3.2 MERIS Product Spreadsheets

PRODUCT ID	MER_RR__0P
NAME DESCRIPTION	Level 0 Reduced Resolution MERIS source packets generated after frame synchronization, demultiplexing and reformated into a serial data stream in computer compatible format for a segment of acquisition of 43.5 min with a header describing the segment
COVERAGE GEOMETRIC RESOLUTION	1150 km * 17500 km 1060 * 1170 at nadir
SEGMENT SIZE RADIOMETRIC RESOLUTION	522 MB maximum ~ 43.5' * 1.6 Mbps / 8 Coded on 16 bits, dependent on channel
RADIOMETRIC ACCURACY	N/A
DATASET	MPH SPH Source packets data stream as described above
AUXILIARY DATA	Orbit state vector Time correlation parameters
NOTES	

PRODUCT ID	MER_RR__BP
NAME	Browse
DESCRIPTION	The browse will be a 3 band colour product derived from level 1b data where three of the MERIS bands will be chosen for the best visualization of the land, sea, ice, cloud features. MERIS product generated systematically for all MERIS RR L0 acquired
COVERAGE	1150 km * 17500 km (1 product per orbit)
GEOMETRI-CAL SAMPLING	4.8 km * 4.8 km resampled in a "pseudo satellite" projection along track
SEGMENT SIZE	3.2 MB
RADIOMETRIC RESOLUTION	n/a variable depending on contrast enhancement
RADIOMETRIC ACCURACY	n/a
DATASET	MPH SPH ADS MDS Public domain compression of MDS (e.g. JPEG) for dissemination
AUXILIARY DATA	FR acquisition flags Latitude, Longitude,. From level 1b summary quality annotations
NOTES	The browse will be produced from the L1b product. The browse product shall be used for MERIS RR and FR product selection

PRODUCT ID	MER_RR_1P
NAME DESCRIPTION	Level 1b Reduced Resolution MERIS product calibrated (radiance) and geolocated.
COVERAGE	1150 km * 17500 km (1 per orbit)
GEOMETRI-CAL SAMPLING	1.2 km * 1.2 km resampled in a "pseudo satellite "projection across track Pixel content: see table 1
SEGMENT SIZE RADIOMETRIC RESOLUTION	532 MB 0.075 $W/m^2/sr/\mu m$
RADIOMETRIC ACCURACY	from 400 to 900 nm < 2% from 900 to 1050 nm < 5%
DATASET	MPH SPH ADS MDS
AUXILIARY DATA	Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation - Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed.
NOTES	Produced systematically. On demand dissemination of multiple of scene size 1150 km * 1150 km

TABLE 1 - MERIS Level 1b Product: overview of the pixel-by-pixel information

field	bytes	Level 1b Top Of the Atmosphere Radiance (Ltoa)
1	2	Ltoa 412.5
2	2	Ltoa 442.5
3	2	Ltoa 490
4	2	Ltoa 510
5	2	Ltoa 560
6	2	Ltoa 620
7	2	Ltoa 665
8	2	Ltoa 681.25
9	2	Ltoa 705
10	2	Ltoa 753.75
11	2	Ltoa 760
12	2	Ltoa 775
13	2	Ltoa 865
14	2	Ltoa 890
15	2	Ltoa 900
16	1	Flags

There are a total of 31 bytes per pixel.

PRODUCT ID	MER_RR__2P
NAME DESCRIPTION	Reference Level 2 Reduced Resolution Meris product generated sytematically from MERIS L1B Water leaving radiance (reflectance) and geophysical products
COVERAGE GEOMETRI-CAL SAMPLING	1150 km * 17500 km 1.2 km * 1.2 km resampled in a "pseudo satellite" projection along track Pixel content: see table 2
SEGMENT SIZE RADIOMETRIC RESOLUTION	620 MB N/A
PRODUCT ACCURACY	Surface reflectance (ocean) < $2 * 10^{-4}$ Surface reflectance (Land) < 5% Chlorophyll retrieval < 15% Yellow substance < 30% Suspended matter < 15% Water vapour < 20% Cloud albedo < 2% Cloud optical thickness ~ 10% Cloud top pressure ~ 40 hPa
DATASET	MPH SPH DSR ADS
AUXILIARY DATA	Surface identification flags included in the level 1b product Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed
NOTES	Produced systematically On demand dissemination of multiple of scene size (1150 * 1150 km)

TABLE 2 - MERIS Level 2 Product: overview of the pixel-by-pixel information

At level 2, each pixel is classified as either ocean or land or cloud (the result of the classification being recorded onthe FLAGS field). Depending on the nature of the pixel, the following information is recorded:

field	bytes	Ocean	Land	Cloud
1	2	rs (band 412.5) NOTE: rs = normalised water leaving radiance (reflectance) (dimensionless)		
2	2	rs (band 442.5)		
3	2	rs (band 490)		
4	2	rs (band 510)		
5	2	rs (band 560)		
6	2	rs (band 620)		
7	2	rs (band 665)		
8	2	rs (band 681.25)		
9	2	rs (band 705)		
10	2	rs (band 753.75)		
11	2	rs (band 775)		
12	2	rs (band 865)		
13	2	rs (band 890)		
14	1	Water Vapour Total Column Content (Log_{10} ($g.m^{-2}$))		
15	1	Algal pigment index I for open oceans [chlorophyll equivalent in $mg.m^{-3}$]	TOA Vegetation Index (dimensionless)	Cloud Top Pressure (hPa)
16	2	Suspended Matter (non absorbing part) [Log_{10} ($g.m^{-2}$)] Yellow Substance (absorbing part [m^{1}]	Spare	Spare
17	1	Algal pigment index II for all waters [chlorophyll equivalent in $mg.m^{-3}$]	BOA Vegetation Index (dimensionless)	Spare
18	1	PAR for fluorescence applications ($W. m^{-2}$)	Surface Pressure (hPa)	Cloud albedo
19	2	Aerosol optical thickness, Aerosol type	Aerosol optical thickness, Aerosol type	Cloud optical thickness
20	3	Flags	Flags	Flags

PRODUCT ID	MER_FR__0P
NAME DESCRIPTION	Level 0 full resolution MERIS product generated after frame synchronization, demultiplexing and reformated into a serial data stream in computer compatible format for a segment of acquisition of a maximum size of 20 min
COVERAGE GEOMETRIC RESOLUTION	1150 km * 8000 km maximum 265 * 292 metres at nadir
SEGMENT SIZE RADIOMETRIC RESOLUTION	3600 MB maximum Coded on 12 bits or more - dependent on channel and transmitted on 16 bits
RADIOMETRIC ACCURACY	N/A
DATASET	MPH SPH Raw data stream as described above
AUXILIARY DATA	Orbit state vector Time correlation parameters
NOTES	Product size will vary as a function of the acquisition plan

PRODUCT ID	MER_FR__2P
NAME	Reference Level 2 full resolution
DESCRIPTION	Meris product generated on request from MERIS L1B Water leaving radiance (reflectance) and geophysical products Floating scene concept for distribution
COVERAGE	575 km * 575 km (also 287.5 km * 287.5 km)
GEOMETRCAL SAMPLING	300 * 300 metres resampled in a "pseudo satellite" projection along track Pixel content: see table 2
SCENE SIZE	187 MB per scene
RADIOMETRIC RESOLUTION	N/A
PRODUCT ACCURACY	Surface reflectance (ocean) < $2 * 10^{-4}$ Surface reflectance (Land) < 5% Chlorophyll retrieval < 15% Yellow substance < 30% Suspended matter < 15% Water vapour < 20% Cloud albedo < 2% Cloud optical thickness ~ 10% Cloud top pressure ~ 40 hPa
DATASET	MPH SPH DSR ADS
AUXILIARY DATA	Surface identification flags included in the level 1b product Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed.
NOTES	On demand dissemination of multiple of scene size (575 km * 575 km or 287.5 km * 287.5 km)

PRODUCT ID	MER_RV__OP
NAME DESCRIPTION	Level 0 Reduced Field of View MERIS source packets generated after frame synchronization, demultiplexing and reformated into a serial data stream in computer compatible format for a segment of acquisition of tbd min with a header describing the segment
COVERAGE GEOMETRIC RESOLUTION	72 km * tbd km 265 * 292 metres at nadir
SEGMENT SIZE RADIOMETRIC RESOLUTION	tbd MB maximum = tbd min * 1.6 Mbps / 8 Coded on 16 bits, dependent on channel
RADIOMETRIC ACCURACY	N/A
DATASET	MPH SPH Source packets data stream as described above
AUXILIARY DATA	Orbit state vector, Time correlation parameters
NOTES	

PRODUCT ID	MER_CA__OP
NAME DESCRIPTION	Level 0 Calibration MERIS source packets generated after frame synchronization, demultiplexing and reformated into a serial data stream in computer compatible format with a header describing the calibration
COVERAGE GEOMETRIC RESOLUTION	N/A N/A
SEGMENT SIZE RADIOMETRIC RESOLUTION	492 Kbytes = 64 packets (61536 bytes per packet) Coded on 16 bits, dependent on channel
RADIOMETRIC ACCURACY	N/A
DATASET	MPH SPH Source packets data stream as described above
AUXILIARY DATA	Orbit state vector, Time correlation parameters
NOTES	

PRODUCT ID	MER_LRC_2P
NAME DESCRIPTION	Cloud Thickness and Water Vapour Content at Low Resolution Meris product generated sytematically from MER_RR__2P Atmosphere geophysical products for Meteo users.
COVERAGE	1150 km * 17500 km (1 per orbit)
GEOMETRIC RESOLUTION	4.8 km * 4.8 km resampled in a "pseudo satellite" projection along track Pixel content: fields 14 (Water Vapour) and 19 (Cloud Optical Thickness) in table 2.
SEGMENT SIZE RADIOMETRIC RESOLUTION	8.7 MB N/A
PRODUCT ACCURACY	Water vapour < 20% Cloud optical thickness ~ 10%
DATASET	MPH SPH DSR ADS
AUXILIARY DATA	Surface identification flags included in the level 1b product Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed.
NOTES	

PRODUCT ID	MER_FR__1P
NAME DESCRIPTION	Level 1b Full Resolution MERIS product calibrated and geolocated. Produced on request Floating scene concept for distribution
COVERAGE GEOMETRCAL SAMPLING	575 km * 575 km 300 * 300 metres resampled in a "pseudo satellite" projection along track Pixel content: see table 1
SCENE SIZE RADIOMETRIC RESOLUTION	157 MB per scene ~ 0.3 $W/m^2/sr/\mu m$
RADIOMETRIC ACCURACY	from 400 to 900 nm < 2% from 900 to 1050 nm < 5%
DATASET	MPH SPH ADS MDS
AUXILIARY DATA	Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation - Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed.
NOTES	On demand dissemination of multiple of scene size (575 km * 575 km)

PRODUCT ID	MER_RRC_2P
NAME DESCRIPTION	Cloud Thickness and Water Vapour Content at Reduced Resolution Meris product generated sytematically from MER_RR__2P Atmosphere geophysical products
COVERAGE GEOMETRIC RESOLUTION	1150 km * 17500 km 1.2 km * 1.2 km resampled in a "pseudo satellite" projection along track Pixel content: fields 14 (Water Vapour) and 19 (Cloud Optical Thickness) in table 2.
SEGMENT SIZE RADIOMETRIC RESOLUTION	104 MB N/A
PRODUCT ACCURACY	Water vapour < 20% Cloud optical thickness ~ 10%
DATASET	MPH SPH DSR (Cloud thickness & Water vapour content)
AUXILIARY DATA	Surface identification flags included in the level 1b product Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed.
NOTES	

PRODUCT ID	MER_RRV_2P
NAME DESCRIPTION	Vegetation Index including Atmospheric Corrections at Reduced Resolution Meris product generated sytematically from MER_RR__2P Land geophysical products
COVERAGE GEOMETRIC RESOLUTION	1150 km * 17500 km 1.2 km * 1.2 km resampled in a "pseudo satellite" projection along track Pixel content: fields 15 (TOA VI) and 17 (BOA VI) in table 2.
SEGMENT SIZE RADIOMETRIC RESOLUTION	87 MB N/A
PRODUCT ACCURACY	N/A Vegetation index
DATASET	MPH SPH DSR (Vegetation index including atmospheric correction)
AUXILIARY DATA	Surface identification flags included in the level 1b product Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation - Extracted from external files: Atmospheric pressure, Total ozone, Relative humidity, Wind speed.
NOTES	

4 AATSR

4.1 AATSR Product Summary Table

AATSR	Processing Level	**Product ID.** Size MB / COVERAGE
Level 0	AATSR Level 0	ATS_NL__0P 490 MB / Full Orbit
Browse	Browse	ATS_AST_BP 4.2 MB / Full Orbit
Level 1b	Geolocated and Calibrated TOA Radiances (Forward and Nadir views coregistered on the same pixel grid)	ATS_TOA_1P 8.4 MB / 512 km * 512 km 728 MB / orbit
Level 2	Gridded Surface Temperatures	ATS_NR__2P 1.6 MB / 512 km * 512 km 126 MB / orbit
Level 2	Spatially Averaged Surface Temperature	ATS_AR_2P 53 MB / orbit
Level 2	AATSR Meteo Product	ATS_MET_2P 3.1 MB / orbit

4.2 AATSR Product Spreadsheets

PRODUCT ID	ATS_NL__0P
NAME DESCRIPTION	Level 0 AATSR product generated after frame synchronization, demultiplexing and reformated into a serial data stream in computer compatible format for an orbit size with a header describing the product
COVERAGE GEOMETRIC RESOLUTION	512 km * 40000 km 1 km * 1 km at nadir
SIZE RADIOMETRIC RESOLUTION	490 MB = 100' * 651 kbps Coded on 12 bits for all 7 channels
RADIOMETRIC ACCURACY	N/A
DATASET	MPH SPH Instrument source packet data stream as described above
AUXILIARY DATA	Orbit state vector, Time correlation parameters
NOTES	Only one mode: data Downlink in permanence

PRODUCT ID	ATS_TOA_1P
NAME DESCRIPTION	Geolocated and Calibrated Top of Atmosphere Brightness Temperatures & Reflectances AATSR products calibrated, geolocated and forward and nadir views co-registered on the same pixel grid
COVERAGE GEOMETRIC RESOLUTION	512 km * 40 000 km 1 km * 1 km resampled in a "pseudo satellite" projection along track
MAXIMUM SIZE RADIOMETRIC RESOLUTION	728 MB NEDT 11 & 12 μm channels < 0.05 K NEDT 3.7 μm channels < 0.064 K NEDL for Vis/NIR < 1% for 0.12 albedo
RADIOMETRIC ACCURACY	for Vis/NIR channel 5% relative to the sun for IR channels < 0.3 kelvin
DATASET	MPH SPH MDS ADS
AUXILIARY DATA	Surface identification flags Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation
NOTES	Produced systematically, On demand dissemination of multiple of scene size 512 km * 512 km

PRODUCT ID	ATS_NR_2P
NAME DESCRIPTION	Gridded Surface Temperature AATSR distributed geophysical product for ocean and land
COVERAGE GEOMETRIC RESOLUTION	512 km * 40 000 km 1 km * 1 km resampled in a "pseudo satellite" projection along track
MAXIMUM SIZE RADIOMETRIC RESOLUTION	126 MB Nadir and combined views distributed product and confidence flags N/A
PRODUCT ACCURACY	N/A for Vis/NIR - vegetation index Sea Surface temperature < 0.3 kelvin
DATASET	MPH SPH MDS ADS
AUXILIARY DATA	Surface identification flags included in the level 1b product Orbit state vector, Time correlation parameters, Latitude, Longitude, altitude and topographic corrections Sun azimuth, Sun elevation, view azimuth, view elevation
NOTES	Produced systematically On demand dissemination of multiple of scene size 512 km * 512 km

PRODUCT ID	ATS_AR_2P
NAME	Spatially Averaged Surface Temperature
DESCRIPTION	Both Averaged TOA Brightness Temperature and Averaged Surface Temperature for different Land and Sea cells at four geometric resolutions (16 cell types) Cloud top Temperature, statistics and annotations provided on a cell record basis
COVERAGE	512 km * 40000 km
GEOMETRIC RESOLUTION	Four resolutions available in parallel: 50 km * 50 km cells, 17 km * 17 km cells, 30 * 30 minute of arc cells, 10 * 10 minute of arc cells
SIZE	53 MB/orbit
RADIOMETRIC RESOLUTION	N/A
RADIOMETRIC ACCURACY	N/A for Vis/NIR - vegetation index Sea Surface temperature < 0.1 kelvin
DATASET	MPH SPH MDS ADS
AUXILIARY DATA	Orbit state vector, Time correlation parameters, Latitude, Longitude, Cloud cover nadir and forward
NOTES	Produced systematically, dissemination on an orbit basis

PRODUCT ID	ATS_AST_BP
NAME DESCRIPTION	Browse The browse is a 3 band colour product derived from level 1b data where three of the AATSR bands have been chosen for the best visualization of the land, sea, ice, cloud for both night and day features
COVERAGE GEOMETRI-CAL SAMPLING	512 km * 40 000 km 4 km * 4 km resampled in a "pseudo satellite" projection along track
SEGMENT SIZE RADIOMETRIC RESOLUTION	4.2 MB n/a
RADIOMETRIC ACCURACY	n/a
DATASET	MPH SPH MDS ADS
AUXILIARY DATA	Orbit state vector, Time correlation parameters, Latitude, Longitude,
NOTES	The browse will be produced from the L1b product. AATSR product generated systematically for all Level 0 acquired

PRODUCT ID	ATS_MET_2P
NAME DESCRIPTION	AATSR Meteo Product Climatology product Average Sea Surface Temperature information for Meteo users with annotations on a cell basis
COVERAGE GEOMETRIC RESOLUTION	512 km * 40000 km 30 * 30 minute of arc cells
SIZE RADIOMETRIC RESOLUTION	3.1 MB 30 * 30 arc minute SST cell from ATS_AR_2P N/A
RADIOMETRIC ACCURACY	Sea Surface temperature < 0.1 kelvin
DATASET	MPH SPH MDS ADS
AUXILIARY DATA	Orbit state vector, Time correlation parameters, Latitude, Longitude
NOTES	Produced systematically

5 MIPAS

5.1 MIPAS Product Summary Table

MIPAS	Processing Level	**Product ID Size MB / Coverage**
Level 0	Nominal mode Level 0	MIP_NL__0P 320 MB / Full Orbit
Level 0	Line of sight calibration mode	MIP_LS__0P 5 MB / Full Orbit
Level 0	Raw data mode and SPE self test mode	MIP_RW__0P 1 MB / second
Level 1b	Geolocated, calibrated limb emission spectra	MIP_NL__1P 300 MB / Full Orbit
Level 2	Profiles of pressure, temperature and primary trace gases	MIP_NL__2P 5.6 MB / Full Orbit
Level 2	MIPAS Meteo Product	MIP_NLE_2P 2.5 MB / Full Orbit

5.2 MIPAS Product Spreadsheets

PRODUCT ID	MIP_NL__0P
NAME	Nominal Mode Level 0
DESCRIPTION	MIPAS source packet data in nominal measurement mode. Data packetized, bit-truncated, time-ordered
COVERAGE	Tangent height range: 5 km... 50 km Pointing range: (Azimuth pointing range relative to S/C velocity vector): 160^0 - 190^0 (rearward looking) 75^0 - 110^0 (sideward looking)
GEOMETRIC RESOLUTION	Instantaneous field of view (IFOV): 0.0523^0 (elevation) * 0.523^0 (azimuth) At line-of-sight (LOS) tangent point: 2.5 km (vertical) * 25 km (horizontal) (rearward looking) 2.5 km (vertical) * 30 km (horizontal) (sideward looking) Length of measurement cell for an individual height step: approx. 300 km ... 500 km (dependent on tangent height and optical properties of the atmosphere)
SIZE	320 MB per orbit
RADIOMETRIC RESOLUTION	Spectral resolution: 0.03 ... 0.035 cm^{-1} Radiometric sensitivity: 4.5 ... 50 nW / cm^{-1} / sr / cm^{-2}
RADIOMETRIC ACCURACY	N/A
DATASET	N/A
AUXILIARY DATA	orbit, attitude
NOTES	

PRODUCT ID	MIP_LS__0P
NAME	Line of Sight Calibration Mode
DESCRIPTION	MIPAS source packet data in line of sight calibration mode. Data packetized, bit-truncated, time-ordered
COVERAGE	Tangent height range: N/A Pointing range: (Azimuth pointing range relative to S/C velocity vector): 160^0 - 190^0 (rearward looking) 75^0 - 110^0 (sideward looking)
GEOMETRIC RESOLUTION	Instantaneous field of view (IFOV): 0.0523^0 (elevation) * 0.523^0 (azimuth)
SIZE	5 MB per orbit
RADIOMETRIC RESOLUTION	N/A
RADIOMETRIC ACCURACY	N/A
DATASET	N/A
AUXILIARY DATA	
NOTES	

PRODUCT ID	MIP_RW__0P
NAME	Raw Data Mode and Self Test Mode
DESCRIPTION	MIPAS source packet data in raw data mode and SPE self test mode. Data packetized, bit-truncated, time-ordered
COVERAGE	Raw data mode only: Tangent height range: 8 km ... 56 km Pointing range: (Azimuth pointing range relative to S/C velocity vector): 160^0 - 190^0 (rearward looking) 75^0 - 110^0 (sideward looking)
GEOMETRIC RESOLUTION	Instantaneous field of view (IFOV): 0.0523^0 (elevation) * 0.523^0 (azimuth) At line-of-sight (LOS) tangent point: 2.5 km (vertical) * 25 km (horizontal) (rearward looking) 2.5 km (vertical) * 30 km (horizontal) (sideward looking) Length of measurement cell for an individual height step: approx. 300 km ... 500 km (dependent on tangent height and optical properties of the atmosphere)
SIZE	1 MB per second max.
RADIOMETRIC RESOLUTION	Spectral resolution: 0.030 ... 0.035 cm^{-1} Radiometric sensitivety: 4.2 ... 50 nW / cm^{-1} / sr / cm^{-2}
RADIOMETRIC ACCURACY	N/A
DATASET	N/A
AUXILIARY DATA	
NOTES	

PRODUCT ID	MIP_NL__1P
NAME	Geolocated calibrated emission spectra
DESCRIPTION	Geolocated, spectrally and radiometrically calibrated limb emission spectra in the 685 cm^{-1} - 2410 cm^{-1} wavenumber range (5 bands: 685 - 995 cm^{-1}, 995 - 1192.5 cm^{-1}, 1192.5 - 1535 cm^{-1}, 1535 - 1785 cm^{-1}, 1785 - 2410 cm^{-1})
COVERAGE	Tangent height range: 5 km ... 50 km Pointing range: (Azimuth pointing range relative to S/C velocity vector): 160^0 - 190^0 (rearward looking) 75^0 - 110^0 (sideward looking)
GEOMETRIC RESOLUTION	Instantaneous field of view (IFOV): 0.0523^0 (elevation) * 0.523^0 (azimuth) At line-of-sight (LOS) tangent point: 2.5 km (vertical) * 25 km (horizontal) (rearward looking) 2.5 km (vertical) * 30 km (horizontal) (sideward looking) Length of measurement cell for an individual height step: approx. 300 km ... 500 km (dependent on tangent height and optical properties of the atmosphere)
SIZE	326 MB per orbit
RADIOMETRIC RESOLUTION	Spectral resolution: 0.030 ... 0.035 cm^{-1} Radiometric sensitivety: 4.2 ... 50 nW / cm^{-1} / sr / cm^{-2}
RADIOMETRIC ACCURACY	685 - 1500 cm^{-1}: 2 * $NESR_T$ + 5 % [true source spectral radiance] 1570 - 2410 cm^{-1}: 2 * $NESR_T$ + * % of [true source spectral radiance], X to be linearly interpolated between 2 at 1570 cm^{-1} and 3 at 2410 cm^{-1} Variation in measured spectral radiance due to worst case orbit variations of instrument temperature: 2 * $NESR_T$ + 1 % [true source spectral radiance]
DATASET	N/A
AUXILIARY DATA	Auxiliary data calibration, auxiliary data validation, Offset IGM validation, Non-linearity calibration, Equalization calibration, BB spectrum validation, BB radiance calibration, BB temperature calibration, Gain validation, LOS reference, LOS validation, localization parameter, scene IGM validation, SPE gain calibration, ASU gain calibration, parameters for spectrum imaginary part validation, ILS retrieval, templates for spectral calibration. Orbit, attitude data, atmospheric refraction index profiles
NOTES	$NESR_T$ = Noise equivalent spectral radiance when the instrument is viewing a black-body source at temperature T.

PRODUCT ID	MIP_NL__2P
NAME	Profiles of pressure, temperature and primary trace gases
DESCRIPTION	Geolocated vertical profiles of p, T, O_3, H_2O, CH_4, N_2O, HNO_3
COVERAGE	Global coverage, i.e. mapping of the Earth stratosphere/mesosphere at all latitudes and longitudes.
GEOMETRIC RESOLUTION	Vertical resolution of p, T and VMR profiles: 3 ... 4 km Horizontal resolution of p, T and VMR profiles: approx. 300 km ... 500 km along track (depending on tangent height range and optical properties of the atmosphere)
SIZE	3.5 MB
RADIOMETRIC RESOLUTION	N/A
RADIOMETRIC ACCURACY	N/A
AUXILIARY DATA	Spectroscopic data, microwindows data, validation data, vertical p, T and trace gas VMR profiles
NOTES	

PRODUCT ID	MIP_NLE_2P
NAME	MIPAS Meteo Product
DESCRIPTION	Geolocated vertical profiles of p, T, O_3, H_2O (extracted from the MIP_NL__2P) for the Meteo users
COVERAGE	Global coverage, i.e. mapping of the Earth stratosphere/mesosphere at all latitudes and longitudes.
GEOMETRIC RESOLUTION	Vertical resolution of p, T and VMR profiles: 3 ... 4 km Horizontal resolution of p, T and VMR profiles: approx. 300 km ... 500 km along track (depending on tangent height range and optical properties of the atmosphere)
SIZE	1.7 MB
RADIOMETRIC RESOLUTION	N/A
RADIOMETRIC ACCURACY	N/A
AUXILIARY DATA	Spectroscopic data, microwindows data, validation data, vertical p, T and trace gas VMR profiles
NOTES	Product formatted from MIP_NL__2P

6 SCIAMACHY

6.1 SCIAMACHY Product Summary Table

SCIAMACHY	Processing Level	Product ID Size MB / Coverage
Level 0	Level 0 Product	SCI_NL__0P 323 MB / Full Orbit
Level 1b	Geolocated, calibrated emission and absorption spectra	SCI_NL__1P 200 MB / Full Orbit
Level 2	Integrated column content of various trage gases	SCI_NL__2P 12 MB / Full Orbit
Level 2	Ozone Integrated Column Amounts for Meteo Users	SCI_RV__2P 1 MB / Regional

6.2 SCIAMACHY Product Spreadsheets

PRODUCT ID	SCI_NL__0P
NAME	Level 0
DESCRIPTION	Raw SCIAMACHY data stream. Data packetized, time-ordered Spectra are acquired on 8 spectral bands (the first two bands can be electronically sub-divided into two sub-bands) with following total wavelength ranges: Band 1: 240 - 314 nm, Band 2: 309 - 405 nm, Band 3: 394 - 620 nm, Band 4: 604 - 805 nm, Band 5: 785 - 1050 nm, Band 6: 1000 - 1750 nm, Band 7: 1940 - 2040 nm, Band 8: 2265 - 2380 nm In parallel polarization is measured in different spectral bands (7 Polarization Measurement Devices): PMD Band 1: 320 - 380 nm, PMD Band 2: 450 - 520 nm, PMD Band 3: 620 - 700 nm, PMD Band 4: 800 - 900 nm, PMD Band 5: 1500 - 1700 nm, PMD Band 6: 2265 - 2380 nm, PMD Band 7: (rotated 45^0 against the others): 800 - 900 nm
COVERAGE	**Nadir measurements:** Instantaneous field of view (IFOV): approx. 0.045^0 * 1.8^0 0.045^0 width aligned in scan direction (orthogonal to flight direction) 1.8^0 width aligned in flight direction Max. swath: 960 km wide (across track) Typical nadir footprint: 60 km (across track) * 30 km (along track) **Limb measurements:** Instantaneous field of view (IFOV): approx. 0.045^0 (elevation) * 1.8^0 (azimuth) approx. 0.045^0 * 0.72^0 (sun measurements) Tangent height range: 0 km ... 100 km Scanning: Azimuth scans are performed for constant elevation angle, typ. 34 elevation steps per limb scan. Max. azimuth range: +/- 44^0 relative to S/C velocity. Note: The azimuth scan range is adjusted to observe the same atmospheric volume as for nadir measurements within 5 minutes.
GEOMETRIC RESOLUTION	**Nadir measurements:** Spatial resolution: Variable (depends on scan speed and integration time) 27 * 30 - 240 * 30 km Typical 60 km (across track) * 30 km (along track) **Limb measurements: Vertical resolution: approx. 3 km** Horizontal resolution: typ. 120 - 960 km (depends on azimuth scan range, scan speed, tangent height and optical properties of the atmosphere)
SIZE	323 MB per orbit
RADIOMETRIC RESOLUTION	Spectral resolution: 0.24 ... 1.5 nm (depends on spectral range)
AUXILIARY DATA	orbit, attitude

PRODUCT ID	SCI_NL__1P
NAME	Geolocated atmospheric spectra in the UV/vis. wavelength range
DESCRIPTION	Geolocated, radiometrically and spectrally calibrated limb and nadir radiance spectra. Limb measurements cover both, emission and solar/lunar occultation spectra.
COVERAGE	**Nadir measurements:** Instantaneous field of view (IFOV): approx. 0.045^0 * 1.8^0 0.045^0 width aligned in scan direction (orthogonal to flight direction) 1.8^0 width aligned in flight direction Max. swath: 960 km wide (across track) Typical nadir footprint: 60 km (across track) * 30 km (along track) **Limb measurements:** Instantaneous field of view (IFOV): approx. 0.045^0 (elevation) * 1.8^0 (azimuth) approx. 0.045^0 * 0.72^0 (sun measurements) Tangent height range: 0 km ... 100 km Scanning: Azimuth scans are performed for constant elevation angle, typ. 34 elevation steps per limb scan. Max. azimuth range: +/- 44^0 relative to S/C velocity. Note: The azimuth range is adjusted to observe the same atmospheric volume as for nadir within 5 minutes.
GEOMETRIC RESOLUTION	**Nadir measurements:** Spatial resolution: Variable (depends on scan speed and integration time) 27 * 30 - 240 * 30 km Typical : 60 km (across track) * 30 km (along track) **Limb measurements: Vertical resolution: approx. 3 km** Horizontal resolution: typ. 120- 960 km (depends on azimuth scan range, scan speed, tangent height and optical properties of the atmosphere)
SIZE	200 MB per orbit
RADIOMETRIC RESOLUTION	Radiometric resolution: 16 bits Spectral resolution: 0.24 ... 1.5 nm (depends on spectral range)
RADIOMETRIC ACCURACY	Sun normalized radiometric accuracy: 2% ... 3 % (unpolarized light) 3 % ... 4 % (polarized light) Relative radiometric accuracy: < 1 % Spectral accuracy: 0.005 ... 0.035 nm
AUXILARY DATA	1. Atmospheric refraction index profiles 2. Orbit state vector 3. Satellite to UTC Time conversion

PRODUCT ID	SCI_NL__2P
NAME	Integrated column amounts of various trace gases.
DESCRIPTION	Atmospheric trace gas column densities for O_3 , NO_2, H_2O, N_2O, CO, CH_4, OClO, H_2CO, SO_2 Cloud coverage and top height Aerosol Absorption Indicator.
COVERAGE	**Nadir measurements:** Instantaneous field of view (IFOV): approx. 0.045^0 * 1.8^0 0.045^0 width aligned in scan direction (orthogonal to flight direction) 1.8^0 width aligned in flight direction Max. swath: 960 km wide (across track) Typical nadir footprint: 30 km (along track) * 60 km (across track) With the maximum swath, a global coverage of the earth is achieved within 3 days.
GEOMETRIC RESOLUTION	**Nadir measurements:** Spatial resolution: Variable (depends on scan speed and integration time) 27 * 30 - 240 * 30 km Typical : 60 km (across track) * 30 km (along track)
SIZE	12 MB per orbit
RADIOMETRIC ACCURACY	
DATASET	
AUXILIARY DATA	Spectroscopic data, climatology data, vertical p, T profiles, total column densities and profile data of O_3, H_2O, Air Mass Factor tables.
NOTES	SCI_NL__2P are only based on nadir measurements. Limb and occultation geometries will be processed off-line at the D-PAC.

PRODUCT ID	SCI_RV__2P
NAME	Ozone integrated column amounts for Meteo Users.
DESCRIPTION	Vertical column amounts of Ozone as resulting from the processing of nadir measurements.
COVERAGE GEOMETRIC RESOLUTION	Regional **Nadir measurements:** Spatial resolution: Variable (depends on scan speed and integration time) 27 * 30 - 240 * 30 km Typical : 60 km (across track) * 30 km (along track)
SIZE RADIOMETRIC ACCURACY	1 MB per orbit
DATASET	
AUXILIARY DATA	Spectroscopic data, climatology data, vertical p, T profiles, total column densities and profile data of O_3, H_2O, Air Mass Factor tables
NOTES	

7 GOMOS

7.1 GOMOS Product Summary Table

Processing Level	Description	Product ID Size / Coverage
Level 0	Nominal Mode Level 0	GOM_NL__0P Typical: 50 MB/orbit Maximum: 180 MB/orbit
Level 0	Monitoring Mode Level 0	GOM_MM__0P Typical:< 1 MB/orbit
Level 1b	Geolocated calibrated transmission spectra and photometer fluxes	GOM_TRA_1P Typical: 4 MB/occultation Maximum: 20 MB/occultation
Level 1b	Geolocated calibrated limb spectra	GOM_LIM_1P Typical: 3 MB/occultation Maximum: 14 MB/occultation
Level 2	Atmospheric constituent profiles	GOM_NL__2P Typical: < 0.5 MB/occultation
Level 2	Residual extinction	GOM_EXT_2P Typical: 2 MB/occultation Maximum: 10 MB/occultation
Level 2	GOMOS meteo product	GOM_RR__2P Typical: 30 kbyte/occultation

7.2 GOMOS Product Spreadsheets

PRODUCT ID	GOM_NL__0P
NAME	Nominal Mode Level 0
DESCRIPTION	Level 0 - Raw occultation data (1 product = 1 orbit of data) Spectra acquired in 3 spectral bands: 250-675 nm (UVIS), 756-773 nm (NIR1) and 926-952 nm (NIR2). Scintillation data acquired by 2 broadband photometers (470 nm to 520 nm and 650 nm to 700 nm) at 1 kHz sampling rate.
COVERAGE	All the occultation paths during the orbit. Elevation range: +62 to +68 deg (corresponding to 15 to 100 km in altitude). Azimuth range: -10 to +90 deg (anti-flight direction)
GEOMETRIC RESOLUTION	Vertical sampling per acquisition: 1.7 km maximum (depending on the geometry of each occultation).
SIZE	Typical: 50 MB/orbit
DATATION	Telemetry datation accuracy: < 5 ms Resolution: < 100 μs

PRODUCT ID	GOM_MM__0P
NAME	Monitoring Modes Level 0
DESCRIPTION	Level 0 - Raw monitoring data Data acquired from one or several of the GOMOS monitoring modes: linearity, uniformity and spatial spread.
COVERAGE	N/A
GEOMETRIC RESOLUTION	N/A
SIZE	< 1 MB/orbit
DATATION	Telemetry datation accuracy: < 5 ms Resolution: < 100 μs

PRODUCT ID	GOM_TRA_1P
NAME	Geolocated Calibrated Transmission Spectra and Photometer Fluxes
DESCRIPTION	Level 1b - Localized calibrated transmissions and photometer fluxes One product corresponds to one occultation. The Level 1b data product contains several fields; the key ones are: - Full transmission spectra. - Central background spectra. - Photometers engineering data.
COVERAGE	Tangent height range: 15 to 100 km Elevation range: +62 to +68 deg Azimuth range: -10 to +90 deg (anti-flight direction)
GEOMETRIC RESOLUTION	Vertical sampling per acquisition: 1.7 km maximum (depending on the geometry and the duration of the occultation).
SIZE	Typical: 4 MB/occultation (depends on the duration of the occultation)

PRODUCT ID	GOM_LIM_1P
NAME	Geolocated Calibrated Limb spectra
DESCRIPTION	Localized calibrated upper and lower background spectra (flat-field corrected, with and without straylight). One product corresponds to one occultation.
COVERAGE	Tangent height range: 15 to 100 km Elevation range: +62 to +68 deg Azimuth range: -10 to +90 deg (anti-flight direction)
GEOMETRIC RESOLUTION	Vertical sampling per acquisition: 1.7 km maximum (depending on the geometry and the duration of the occultation).
SIZE	Typical: 3 MB/occultation (depending on the duration of the occultation)

PRODUCT ID	GOM_NL__2P
NAME	Atmospheric constituents profiles
DESCRIPTION	Atmospheric constituents profiles: Vertical and line density profiles of ozone, NO_2, NO_3, O_2, H_2O, air, aerosols, temperature, turbulence
COVERAGE	Tangent height range: 15 to 100 km Elevation range: +62 to +68 deg Azimuth range: -10 to +90 deg (anti-flight direction)
SIZE	Typical: < 0.5 MB/occultation (depending on the duration of the occultation)

PRODUCT ID	GOM_EXT_2P
NAME	Residual extinction
DESCRIPTION	Re-computed transmission spectra corrected for scintillation and dilution effects, before and after inversion One product corresponds to one occultation.
COVERAGE	Tangent height range: 15 to 100 km Elevation range: +62 to +68 deg Azimuth range: -10 to +90 deg (anti-flight direction)
SIZE	Typical: 2 MB/occultation (depending on the duration of the occultation)

PRODUCT ID	GOM_RR__2P
NAME	GOMOS Meteorological product
DESCRIPTION	Extracted profiles of Temperature and Ozone for NRT dissemination to meteo users
COVERAGE	Tangent height range: 15 to 100 km Elevation range: +62 to +68 deg Azimuth range: -10 to +90 deg (anti-flight direction)
SIZE	The profiles are geolocated Typical: 30 Kbytes/occultation (depending on the duration of the occultation)

8 RA-2/MWR

8.1 RA-2/MWR Product Summary Table

RA-2/ MWR	Processing Level	**Product ID** Size MB / COVERAGE
Level 0	RA-2 Measurement Mode Level 0	RA2_ME__0P 75 MB / orbit
Level 0	MWR Level 0	MWR_NL__0P 1 MB / orbit
Level 0	RA-2 IF Calibration and BITE Mode Level 0	RA2_CAL_0P 1 MB maximum / orbit
Level 1B	Geolocated Calibrated altimeter wave-forms with TOA Microwave Brightness Temperatures	RA2_MW__1P 35 MB / half orbit
Level 2	Geophysical Data Record from RA-2 and Water Vapour/Liquid Content from MWR (different consolidation flags)	RA2_MWG_2P 7 MB / half orbit
	N = Fast delivery Geophysical Data Record	
	P = Intermediate Geophysical Data Record	
	V = Geophysical Data Record	
Level 2	Sensor Data Record from RA-2, Water Vapour/Liquid Content from MWR and Individual Uncalibrated Waveforms from RA-2	RA2_MWS_2P 31 to 40 MB/ half orbit
Level 2	Wind/Wave product with water vapour-information for meteo users	RA2_WWV_2P 1 MB / orbit

8.2 RA-2/MWR Product Spreadsheets

PRODUCT ID	RA2_ME__0P
NAME DESCRIPTION	Radar Altimeter Measurement Mode Level 0 This product contains raw data from the nadir pointing pulse limited Radar Altimeter, which is used to measure sea level and land topography along the satellite ground track. The Level 0 product consists of a series of data source packets with PCDs
COVERAGE	Full orbit (1 product per orbit)
SPATIAL SAMPLING	~ 390 metres along track
SIZE	75 MB
GEOMETRIC RESOLUTION	19 km
RADIOMETRIC ACCURACY	0.2 dB
DATASET	MPH + SPH + Measurement data set (MDS) : Timer ordered sequence of Instrument data packet
AUXILIARY DATA	
NOTES	

PRODUCT ID	MWR_NL__0P
NAME DESCRIPTION	Microwave Radiometer Level 0 Raw MWR data stream (data packetized)
COVERAGE GEOMETRIC RESOLUTION	full orbit n/a measurement every 1 km
SIZE RADIOMETRIC RESOLUTION	~ 1 MB n/a
RADIOMETRIC ACCURACY	n/a
DATASET	MPH SPH MDS
AUXILIARY DATA	None
NOTES	

PRODUCT ID	RA2_MW__1P
NAME	Geolocated calibrated altimeter waveforms with TOA Microwave Brightness temperatures
DESCRIPTION	This is the basic level 1B product for RA-2 and MWR which is used as the foundation product for all subsequent RA-2/MWR products. The RA-2 MDS contains data calibrated and converted to engineering units. The MWR MDS contains radiometrically and geometrically corrected brightness temperature measurements for each channel (e.g. 64 brightness temperatures for each channel,averaged over 1.2 sec collocated at the satellite nadir over sea, land and ice surfaces).
COVERAGE	half orbit (2 products per orbit)
SPATIAL	~390 m along track (18 Hz) for RA-2 MDS
SAMPLING	~ pixel spacing 8 km along track (average of 8 measurements) for MWR MDS ~ full rate for burst mode MDS
SIZE	~27 MB per pass : 55000 records * ~550 bytes for RA-2 MDS ~0.15 MB (5000 Data set records * ~30 bytes) for MWR MDS ~ 8 MB for burst mode MDS
GEOMETRIC RESOLUTION	19 km
RADIOMETRIC ACCURACY	0.2 dB
DATASET	MPH + SPH MDS RA-2: consisting of Data Set Record: science data record (20 data record per instrument source packet) (science data have been corrected for internal time delays, IF transfer function, Gain calibration) BURST MODE MDS MWR MDS: 5000 Data set record
AUXILIARY DATA	Orbit state vectors Gain calibration USO frequency Internal time delays (to convert time trigger to range) IF transfer function RA-2 and MWR Instrument Characterisation Flight calibration database Time reference data Land-sea coverage
NOTES	

PRODUCT ID	RA2_MWG_2P
NAME DESCRIPTION	FDGDR, IGDR, GDR (see note) Geophysical Data Record from RA-2 and water vapour liquid content from MWR
COVERAGE SPATIAL SAMPLING	1 pass (half orbital revolution), pole-pole (2 products per orbit) ~ 390 m along track
SIZE GEOMETRIC RESOLUTION	3 MB 19 km
RADIOMETRIC ACCURACY	0.2 dB
DATASET	MPH SPH RA-2 MDS MWR MDS
AUXILIARY DATA	Orbit state vectors (DORIS, FOS) RA-2 and MWR characterisation data Platform attitude Gain calibration USO frequency ECMWF data time relation leap second Ionospheric corrections geoid, mean sea surface slope data tide model (ocean, earth, loading, pole)
NOTES	This product exists at different consolidation stages identified by the following flags: N = Fast delivery geophysical data record (FDGDR) P = Intermediate geophysical record (IGDR) V = Geophysical data record (GDR)

PRODUCT ID	RA2_WWV_2P
NAME DESCRIPTION	RA-2 Meteo Product Wind/Wave product with water vapour information for meteo users
COVERAGE SPATIAL SAMPLING	1 orbit ~ 390 m along track
SIZE GEOMETRIC RESOLUTION	0.5 MB 19 km
RADIOMETRIC ACCURACY	0.2 dB
DATASET	MPH SPH MDS (wave height, wind speed and water vapour content)
AUXILIARY DATA	Orbit state vectors (DORIS, FOS) RA-2 and MWR characterisation data Platform attitude Gain calibration USO frequency ECMWF data Time relation Leap second
NOTES	This product is a reformatted subset of the FDGDR. It is also produced 3 days after data take at the F-PAC with the DORIS preliminary orbit (subset of the IGDR).

PRODUCT ID	RA2_MWS_2P
NAME DESCRIPTION	Sensor Geophysical Data Record Sensor Data Record from RA-2, Water Vapour/Liquid Content from MWR and Individual Uncalibrated Waveforms from RA-2 and Burst mode data
COVERAGE SPATIAL SAMPLING	1 pass, pole-pole (2 products per orbit) ~ 390 m along track
SIZE GEOMETRIC RESOLUTION	29 to 37 MB depending on Burst mode data presence 19 km
RADIOMETRIC ACCURACY	0.2 dB
DATASET	MPH SPH MDS RA-2 from GDR MDS MWR MDS Individual waveform (18 Hz) MDS Burst waveform full rate
AUXILIARY DATA	Orbit state vectors (DORIS, FOS) RA-2 and MWR characterisation data Platform attitude Gain calibration USO frequency ECMWF data time relation leap second Ionospheric corrections geoid, mean sea surface slope data tide model (ocean, earth, loading, pole)
NOTES	

9 DORIS and Orbit Products

9.1 DORIS and Orbit Products Summary Table

DORIS & Orbits Products	Processing Level	**Product ID** Size MB / COVERAGE
Level 0	DORIS Navigator	DOR_NAV_0P 24 KByte per orbit
Level 0	DORIS Doppler Level 0	DOR_DOP_0P 120 KByte per orbit
Level 1B	DORIS Doppler Level 1b (generated by CTDP)	DOR_DOP_1P
Level 2	DORIS Preliminary Orbit State Vector (computed by CTDP)	DOR_POR_2P
Level 2	DORIS Precise Orbit (computed by CTDP)	DOR_VOR_2P
Auxiliary Data	Predicted Orbit State Vector (computed by ESOC FOS)	AUX_FPO_AX
Auxiliary Data	Restituted Orbit (computed by ESOC FOS)	AUX_FRO_AX

9.2 DORIS and Orbit Product Spreadsheets

PRODUCT ID	DOR_NAV_0P
NAME	DORIS Navigator level 0
DESCRIPTION	DORIS Navigator Product generated after frame synchronisation, demultiplexing and formatted into a file containing annotated DORIS Navigator Instrument Source Packet (1292 bytes). The DORIS Navigator Instrument Source Packet contains 39 or 40 DORIS Navigator Bulletin, per Instrument Source Packet. The DORIS Navigator Bulletin is 16 words (16 bit per word) containing the DORIS computed Orbit state vector.
COVERAGE	one orbit unconsolidated - one or more orbit when consolidated One Navigator Instrument Source Packet (1292 bytes) every 320 seconds
TEMPORAL SAMPLING	na
SIZE	24 Kbytes per Orbit
GEOMETRIC RESOLUTION	Navigator Bulletin accuracy: Position: 10 m RMS radial, along and across track Velocity: 1 cm/sec RMS radial, along and across track
RADIOMETRIC ACCURACY	na
DATASET	MPH SPH one MDSR (with 1 annotated Instrument Source Packet per MDSR)
AUXILIARY DATA	Predicted Orbit State Vector from ESOC FOS Satellite to UTC Time conversion table
NOTES	This product is used internally by the PDS Near Real Time Processing chain as an input to the Orbit propagator software (GENOPS) The consolidated product is available at the LRAC after 2 weeks after sensing.

PRODUCT ID	DOR_DOP_0P
NAME DESCRIPTION	DORIS Doppler Level 0 DORIS Doppler Product generated after frame synchronisation, demultiplexing and formatted into a file containing annotated DORIS Doppler Instrument Source Packet (1292 byte).
COVERAGE	one orbit unconsolidated - one or more orbit when consolidated One Doppler Instrument Source Packet (1292 byte) each 64 second
GEOMETRIC RESOLUTION	tbd
SIZE RADIOMETRIC RESOLUTION	120 Kbytes per orbit tbd
RADIOMETRIC ACCURACY	tbd
DATASET	MPH SPH MDS with 1 annotated ISP per MDSR
AUXILIARY DATA	Predicted Orbit State Vector from ESOC FOS in the MPH Satellite to UTC Time conversion table in the MPH
NOTES	This product is systematically transferred to the F-PAC CTDP to generate the level1b, the Preliminary and Precise orbit products. The consolidated product is available at the LRAC after 2 weeks after sensing.

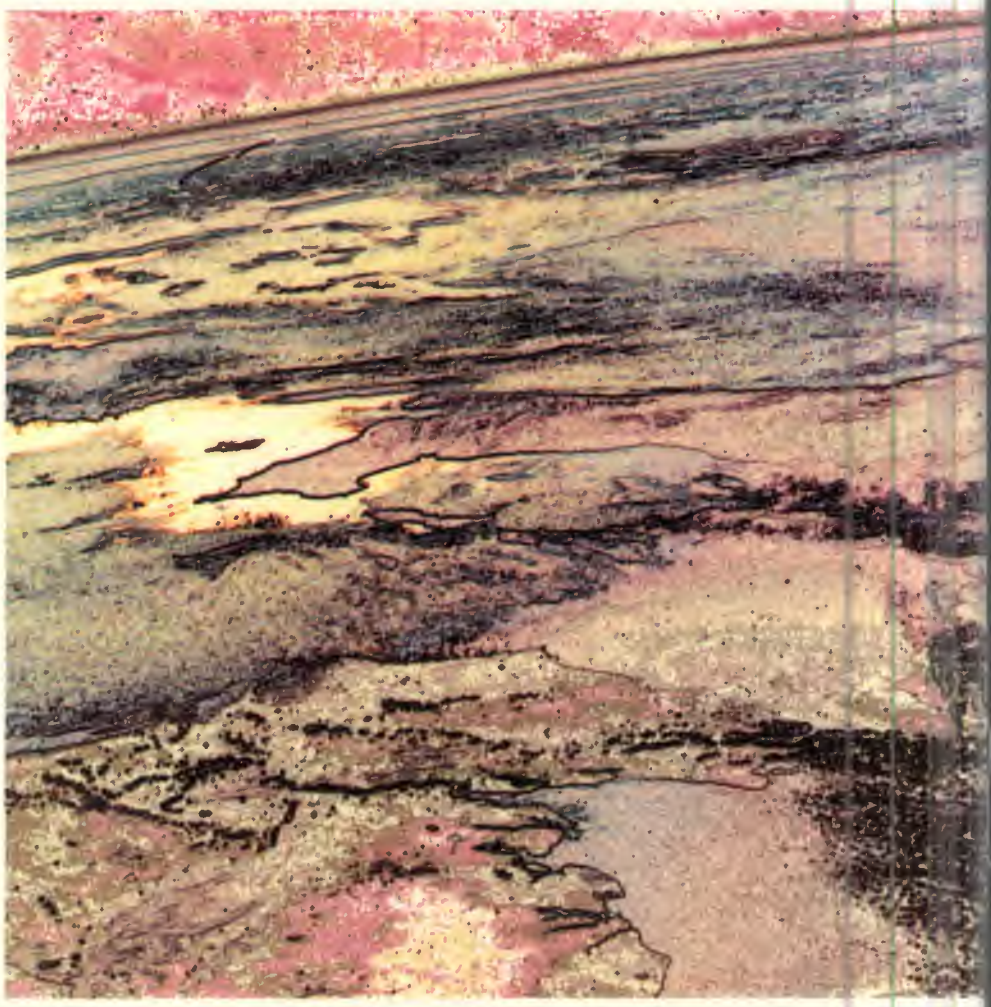
PRODUCT ID	DOR_DOP_1b
NAME DESCRIPTION	DORIS Doppler level 1b TBD CTDP
COVERAGE THROUGHPUT	TBD CTDP TBD CTDP
SPATIAL SAMPLING	TBD CTDP
SIZE GEOMETRIC RESOLUTION	TBD CTDP TBD CTDP
RADIOMETRIC ACCURACY	TBD CTDP
DATASET	TBD CTDP
ANCILLIARY DATA	TBD CTDP
AUXILIARY DATA	TBD CTDP
NOTES	This product is generated by the Centre de Traitement DORIS Poseidon (CTDP), 3 days after sensing (TBC), and stored into the F-PAC archive.

PRODUCT ID	DOR_POR_2P
NAME DESCRIPTION	DORIS Preliminary orbit This product is created 3 days after reception of the Doppler level 0 product at the CTDP. The product is stored into the F-PAC archive and appears in the PDS Inventory. The product contains 1 state vector per record, and 1 record per minute along the orbit(s).
COVERAGE TEMPORAL SAMPLING	one orbit per product, with 120 minutes overlap between products 1 orbit state vector per minute along the orbit(s)
SIZE GEOMETRIC RESOLUTION	tbd Orbit state vector accuracy: Position: 20 cm RMS radial, 40 cm RMS along and 40 cm RMS across track
RADIOMETRIC ACCURACY	
DATASET	MPH SPH one MDS with 1 annotated orbit state vector per MDSR
AUXILIARY DATA	tbd
NOTES	This product is used internally by the PDS Processing chain, off-line, as an input for orbit propagation software (INTERPOL) This product has the same file format as the FOS Predicted Orbit State Vector, FOS Restituted Orbit State Vector and the DORIS Precise Product.

PRODUCT ID	DOR_VOR_2P
NAME DESCRIPTION	DORIS Precise orbit This product is created 4 to 5 weeks after reception of the Doppler level 0 product at the CTDP. The product is stored into the F-PAC archive and appears in the PDS Inventory. The product contains 1 state vector per record, and 1 record per minute along the orbit(s).
COVERAGE THROUGHPUT	one orbit per product, with 120 minutes overlap between products tbd
TEMPORAL SAMPLING	1 orbit state vector per minute along the orbit(s)
SIZE GEOMETRIC RESOLUTION	tbd Orbit State Vector Accuracy Position: 10 cm RMS radial, 30 cm RMS along and 30 cm RMS across track
RADIOMETRIC ACCURACY	
DATASET	MPH SPH one MDS with 1 annotated orbit state vector per MDSR
AUXILIARY DATA	tbd
NOTES	This product is used internally by the PDS Processing chain, off-line, as an input for orbit propagation software (INTERPOL) This product has the same file format as the FOS Predicted Orbit State Vector, FOS Restituted Orbit State Vector and the DORIS Preliminary Product.

PRODUCT ID	AUX_FPO_AX
NAME DESCRIPTION	ESOC Flight Operation Segment Envisat Predicted Orbit State Vector This product contains the Envisat Predicted Orbit State Vector computed by the ESOC Flight Dynamic group, used by the PDS Processing chain in near real time for geolocation purposes.
COVERAGE	6 days of orbit state vector (i.e about 86 state vectors) Generated by ESOC FOS once per day and covering the next 6 days.
TEMPORAL SAMPLING	1 orbit state vector per orbit close to the ANX
SIZE GEOMETRIC RESOLUTION	tbd Orbit State Vector Accuracy (worst case of Solar activity): Position: <25 m (3 sigma) radial, < 900 m (3 sigma) along and <15 m (3 sigma) across track Velocity: <955 mm/sec (3 sigma) radial, < 29 mm/sec (3 sigma) along and <16 mm/ sec (3 sigma) across track
RADIOMETRIC ACCURACY	na
DATASET	MPH SPH one MDS with 1 annotated orbit state vector per MDSR
AUXILIARY DATA	none
NOTES	This product is used internally by the PDS Processing chain, in near real time, as an input for orbit propagation software (GENOPS) This product has the same file format as the FOS Restituted Orbit State Vector, The DORIS Preliminary and the DORIS Precise Product. This product will be permanently archived at the PDS LRAC

PRODUCT ID	AUX_FRO_AX
NAME DESCRIPTION	ESOC Flight Operation Segment Envisat Restituted Orbit State Vector This product contains the Envisat Predicted Orbit State Vector computed by the ESOC Flight Dynamic group, used by the PDS Processing chain in off line mode, for geolocation purposes.
COVERAGE	one or more orbit Generated by ESOC FOS 3 days after the event.
TEMPORAL SAMPLING	1 orbit state vector per minute along the orbit(s)
SIZE GEOMETRIC RESOLUTION	tbd Orbit State Vector Accuracy: Position: <25 m (3 sigma) radial, < 60 m (3 sigma) along and <15 m (3 sigma) across track Velocity: <40 mm/sec (3 sigma) radial, < 27 mm/sec (3 sigma) along and <14 mm/sec (3 sigma) across track
RADIOMETRIC ACCURACY	na
DATASET	MPH SPH one MDS with 1 annotated orbit state vector per MDSR
AUXILIARY DATA	none
NOTES	This product is used internally by the PDS Processing chain, off-line, as an input for orbit propagation software (INTERPOL) This product has the same file format as FOS Predicted Orbit State Vector, The DORIS Preliminary and the DORIS Precise Product. This product will be permanently archived at the PDS LRAC



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