

MERIS CYCLIC REPORT 23RD

DECEMBER 29TH 2003 – FEBRUARY 02ND 2004



MERIS acquired the tenth-thousand orbit on 28 January 2004

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1 INTRODUCTION

The MERIS Cyclic Report is distributed by ESRIN-PCF (Product Control Facility) to keep the MERIS Community informed of any modification regarding the processor, updates of auxiliary products, anomalies of the instrument behavior, data acquisition and processing, and finally the status of the calibration, validation, and quality control activities.

The Cyclic Report collects the inputs coming from different groups involved in MERIS data exploitation:

- ESRIN- Product Control Facility (PCF)
- Quality Working Group (QWG)
- MERIS/AATSR validation team (MAVT)
- Brockmann Consult (BC)
- ACRI-st
- Laboratoire d'Océanographie de Villefranche (LOV)
- Centre National d'Études Spatiales (CNES)
- Frei Universitat Berlin (FUB)
- Laboratoire Interdisciplinaire en Sciences de l'Environnement (LISE)

The main objective of the Cyclic Report is to provide the users community with useful information regarding the instrument performances, the data production chain, the results of calibration activities and validation campaigns, at the end of each ENVISAT cycle, which represents 501 orbits, about 35 days.

1.1 Acronyms and abbreviations

ADS	Auxiliary Data Server
ARF	Archiving Facility (PDS)
CNES	Centre National d'Études Spatiales
CTI	Configuration Table Interface
CR	Cyclic Report
DMOP	Detailed Mission Operation Plan
DS	Data Server
DSD	Data Set Descriptor
FUB	Freie Universitat Berlin
GS	Ground Segment
IAT	Interactive Analysis Tool
IDL	Interactive Data Language
IECF	Instrument Engineering and Calibration Facilities
IPF	Instrument Processing Facilities (PDS)
INV	Inventory Facilities (PDS)

JRC	Joint Research Centre
LAN	Local Area Network
LISE	Laboratoire Interdisciplinaire en Sciences de l'Environnement
LOV	Laboratoire d'Océanographie de Villefranche-sur-mer
MERIS	Medium Resolution Image Spectrometer
MPH	Main Product Header
OP	Operational Phase of ENVISAT
PAC	Processing and Archiving Centre (PDS)
PDCC	Payload Data Control Centre (PDS)
PDHS	Payload Data Handling Station (PDS)
PDS	Payload Data Segment
QC	Quality Control
QWG	Quality Control Working Group
QUARC	Quality Analysis and Reporting Computer
SPH	Specific Product Header
SQADS	Summary Quality ADS

2 SUMMARY

Cycle #23 starts on December 29th 2003 and ends on February 02nd 2004.

No auxiliary files were disseminated during the cycle.

Four radiometric calibrations have been successfully executed.

The actual status of MERIS IPF4.07 products quality is reported in details in par. 6.1 and 6.2.

Information about the start and stop of the cycle can be found in the table below.

Cycle number	23
Start time	29 December 2003, 21:59:29
Stop time	02 February 2004, 21:59:29
Start orbit	9574
Stop orbit	10074

3 SOFTWARE VERSION AND PROCESSING CONFIGURATION

3.1 Software version

The list of documents applied to the current release, IPF4.07, is given in the following.

MERIS IPF: 04.07

Prototype Version: MEGS V6.2p3

Applicable and Reference Documents:

1. ENVISAT Product Specification	Iss_3_Rev_J	PO-RS-MDA-GS-2009
2. MERIS Input/Output Data Definition	Iss_6_Rev_1a_010914	PO-TN-MEL-Gs-0003
3. MERIS Level 1b Detailed Processing Model	Iss_6_Rev_1a_010914	PO-TN-MEL-GS-0002
4. MERIS Level 1b Detailed Processing Model	Iss_6_Rev_1a_010914	PO-TN-MEL-GS-0006

Issues 6.1a consist in issue 6.1 augmented/corrected by change pages issued as 6.1a

3.2 Auxiliary data files

No new auxiliary files were disseminated during cycle #23.

Product description	Product name	Comment
Level 1 aux files		

Instrument characterization data	MER_INS	No changes
Processing Level 1 control parameters data	MER_CP1	No changes
Radiometric calibration data	MER_RAC	No changes
Digital Roughness Model	MER_DRM	No changes
Digital Elevation Model	AUX_DEM	No changes
Land Surface Map	AUX_LSM	No changes
Attitude data file	AUX_ATT	No changes
Level 2 aux files		
Aerosol Climatology data	MER_AER	No changes
Atmosphere Parameter data	MER_ATP	No changes
Cloud measurement parameters data	MER_CMP	No changes
Processing Level-2 control parameters data	MER_CP2	No changes
Land aerosols parameters data	MER_LAP	No changes
Land vegetation index parameters data	MER_LVI	No changes
Ocean aerosols parameters data	MER_OAP	No changes
Ocean I parameters data	MER_OC1	No changes
Ocean II parameters data	MER_OC2	No changes
Water Vapour Parameters	MER_WVP	No changes

Note: The other files not listed change every time (ECMWF).

3.2.1 LEVEL 1/LEVEL 2 CONFIGURATION (SCIHIO2)

The configuration used to process MERIS data from Level 0 to Level 1/Level 2 is the following:

- Level 1 Configuration

Product name	Start Validity
--------------	-------------------

MER_INS_AXVIEC20030620_120000_20020321_193100_20121008_190821	21/03/02
MER_CP1_AXVIEC20030620_120000_20020429_040000_20120920_173421	29/04/02
MER_RAC_AXVIEC20030620_120000_20021224_121445_20121224_121445	24/12/03
MER_DRM_AXVIEC20020122_083343_20020101_000000_20200101_000000	01/03/02
AUX_DEM_AXVIEC20020123_121901_20020101_000000_20200101_000000	01/03/02
AUX_LSM_AXVIEC20020123_141228_20020101_000000_20200101_000000	01/03/02
AUX_ATT_AXVIEC20020924_131534_20020703_120000_20781231_235959	03/07/02

- Level 2 Configuration

Product name	Start Validity
MER_AER_AXVIEC20030620_120000_20020321_193100_20200101_000000	21/03/02
MER_ATP_AXVIEC20030620_120000_20021224_121445_20121224_121445	24/12/02
MER_CMP_AXVIEC20030620_120000_20021224_121445_20120321_193100	24/12/02
MER_CP2_AXVIEC20031120_104149_20021224_121445_20121224_121445	24/12/02
MER_LAP_AXVIEC20030715_151450_20020321_193100_20120321_193100	21/03/02
MER_LVI_AXVIEC20030620_120000_20020321_193100_20130224_164916	21/03/02
MER_OAP_AXVIEC20030620_120001_20020321_193100_20120321_193100	21/03/02
MER_OC1_AXVIEC20030620_120000_20020321_193100_20120321_193100	21/03/02
MER_OC2_AXVIEC20030620_120000_20020321_193100_20120624_174339	21/03/02
MER_WVP_AXVIEC20030620_120000_20020321_193100_20120321_193100	21/03/02

3.3 Configuration Table Interface (CTI)

No Configuration Tables were disseminated during the cycle.

3.4 Level 1/ Level 2 RR or FR products

During cycle #23 no changes regarding format or algorithms for L1b/ L2 products were applied.

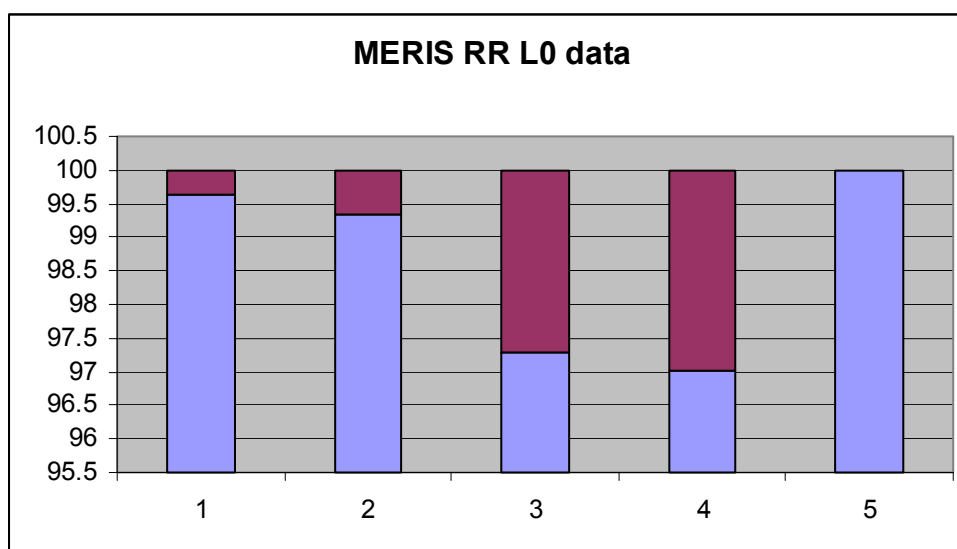
4 PDS STATUS AND INSTRUMENT UNAVAILABILITY

The statistics resulting from the query to the PDS inventory facility (INV) for the MERIS products availability are presented in the following.

4.1 MERIS RR/FR Level 0 products

Table below shows the statistics regarding the RR L0 availability (compared with the planned production).

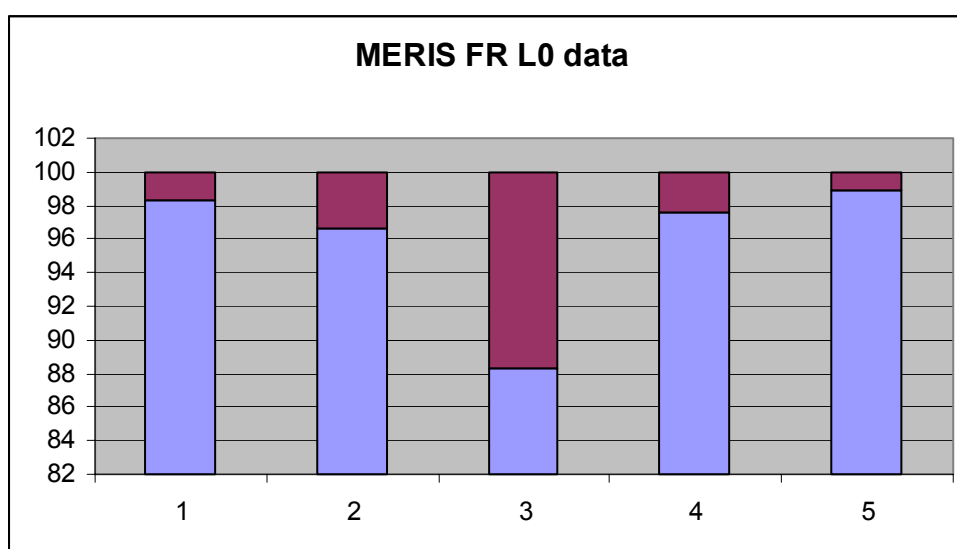
Week	MER_RR_0P	%
From 29/12 to 05/01	Inventoried	99.65
	Missing	0.35
From 05/01 to 12/01	Inventoried	99.35
	Missing	0.65
From 12/01 to 19/01	Inventoried	97.29
	Missing	2.71
From 19/01 to 26/01	Inventoried	97.01
	Missing	2.99
From 26/01 to 02/02	Inventoried	100.00
	Missing	0.00



The number of RR Level 0 products acquired during the cycle is about 98.66% of the planned ones.

Table below shows the statistics regarding the FR L0 availability (compared with the planned production).

Week	MER FR_0P	%
From 29/12 to 05/01	Inventoried	98.26
	Missing	1.74
From 05/01 to 12/01	Inventoried	96.62
	Missing	3.38
From 12/01 to 19/01	Inventoried	88.26
	Missing	11.74
From 19/01 to 26/01	Inventoried	97.64
	Missing	2.36
From 26/01 to 02/02	Inventoried	98.89
	Missing	1.11



The number of FR Level 0 products generated during the cycle is about 95.93% of the planned ones.

4.2 MER_CA__0P products

During cycle #23 four routine radiometric calibrations, two RGC Diffuser 1, one Diffuser Ageing and one Wavelength Type 2 were planned. The following calibrations:

MER_CA__0PNPDK20040104_200913_000001792023_00085_09658_0002.N1	DAC
MER_CA__0PNPDE20040104_233024_000001802023_00087_09660_0018.N1	WV2
MER_CA__0PNPDE20040105_011100_000001792023_00088_09661_0019.N1	WV2
MER_CA__0PNPDE20040105_025135_000001792023_00089_09662_0020.N1	WV2
MER_CA__0PNPDE20040105_043211_000001792023_00090_09663_0022.N1	WV2
MER_CA__0PNPDE20040118_224923_000001792023_00287_09860_0037.N1	RGC
MER_CA__0PNPDK20040201_220758_000001792023_00487_10060_0005.N1	RGC

were successfully executed on the 4th and 5th of January in orbit 9658, 9660, 9661, 9662, 9663, on the 18th of January in orbit 9860, on the 1st of February in orbit 10060. The second orbit 9659 of DAC calibration was lost.

4.3 Instrument Unavailability

No instrument unavailability was communicated by ESOC during the cycle.

5 CALIBRATION AND INSTRUMENT CHARACTERIZATION

5.1 Calibration

5.1.1 RADIOMETRIC CALIBRATION

During cycle #23 two Radiometric Gain Calibration, one Diffuser Ageing and one Wavelength type 2 Calibration were successfully executed on the 4th and 5th of January, 18th of January and 1st of February 2004. For more details see par. 4.2.

5.1.2 SPECTRAL CALIBRATION

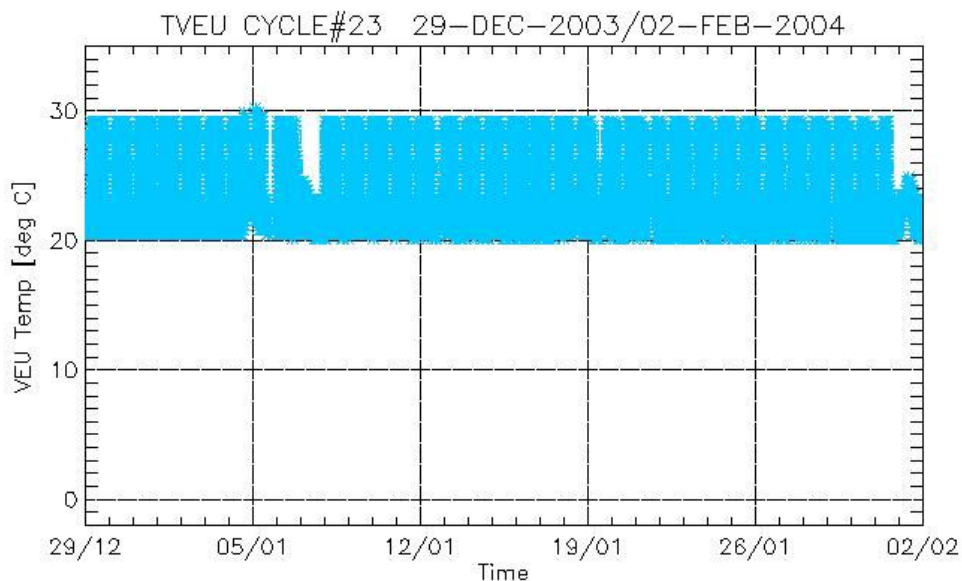
No spectrometric calibrations were performed during cycle #23.

5.1.3 VEU TEMPERATURE ANALYSIS

During one of the operation modes of MERIS, Stabilization mode, a thermal regulation of VEU (Video Electronic Unit) unit is performed in order to stabilize its temperature to reach full performances and insure a safe transition towards Observation and Calibration modes.

During observation, the VEU Temperature has to remain in the operational acceptance temperature range $-10^{\circ}/+50^{\circ}$ in order to meet the image quality requirements. The VEU temperature should be maximum $\pm 10^{\circ}\text{C}$ different from the last radiometric calibration for optimum performance.

During cycle #23 the VEU temperature does not show any anomalous behavior, being into the nominal operating temperature range. A lack of telemetry data from FOS is shown for the period January 5th-9th.

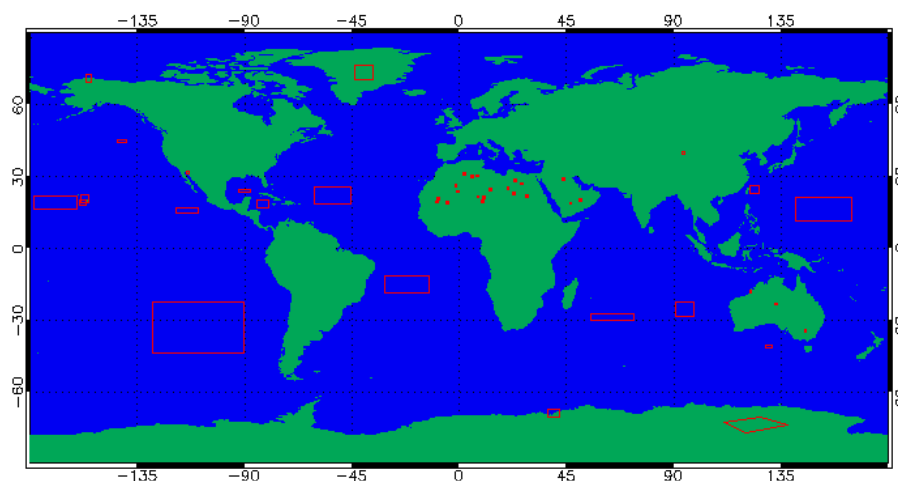


5.1.4 VICARIOUS CALIBRATION RESULTS

For absolute calibration of MERIS by vicarious methods, METRIC2.0 tools is used to perform data extraction and spatial compression from MERIS Level1b products over specified sites following site type specific radiometric and geographic criteria. The child L1b products are ordered systematically on the basis of sites definition and mission analysis. Because the list of sites can be over dimensioned and vary with season, it has a validity period of 3 months. Each L1b child product is submitted to METRIC with the correct version of auxiliary files MER_INS_AX and MER_CP1_AX used during its generation and a dedicated resource file where are stored all parameters necessary for data filtering (cloud and aerosol screening, distance from coast...). Metric generates one file for each selected site pertaining to the following categories, according to the potential use of the data in the calibration processing: Rayleigh, Glitter, Desert, Snow, and Buoy. Output files have HDF format.

The site map is shown in the following picture:

METRIC Vicarious Calibration Sites



During the cycle Metric has generated for specific sites the following results:

Sites	#Products
DESERT	306
GLITTER	62
RAYLEIGH	141
SNOW	15
BUOY	22

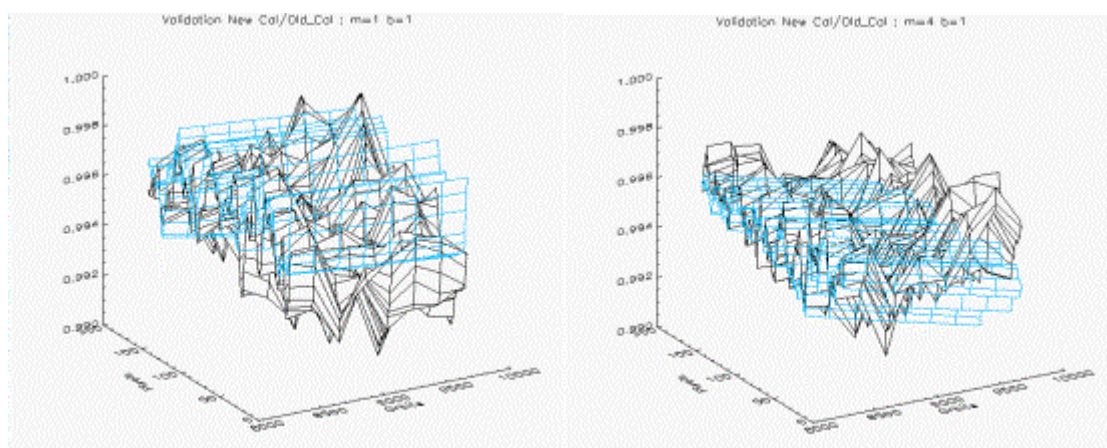
For a comparison between MERIS data and in situ measurements of natural targets, performed by CNES, refer to Cyclic Report #17. The report can be found on the ESA website:

<http://earth.esa.int/pcs/envisat/meris/reports/cyclic/>

5.2 Instrument Characterization

5.2.1 INSTRUMENT DEGRADATION

The degradation model has been fitted on orbits up to #8000 and then applied on more recent ones. The results show neither significant increase of RMSE nor artificial structures. See plots below.

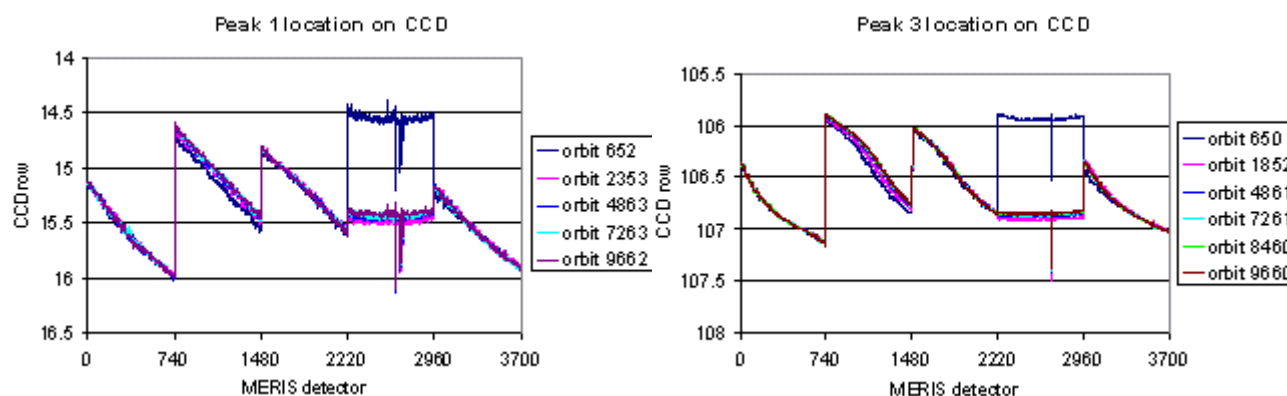


5.2.2 DIFFUSER AGEING

No new results to be shown for the cycle.

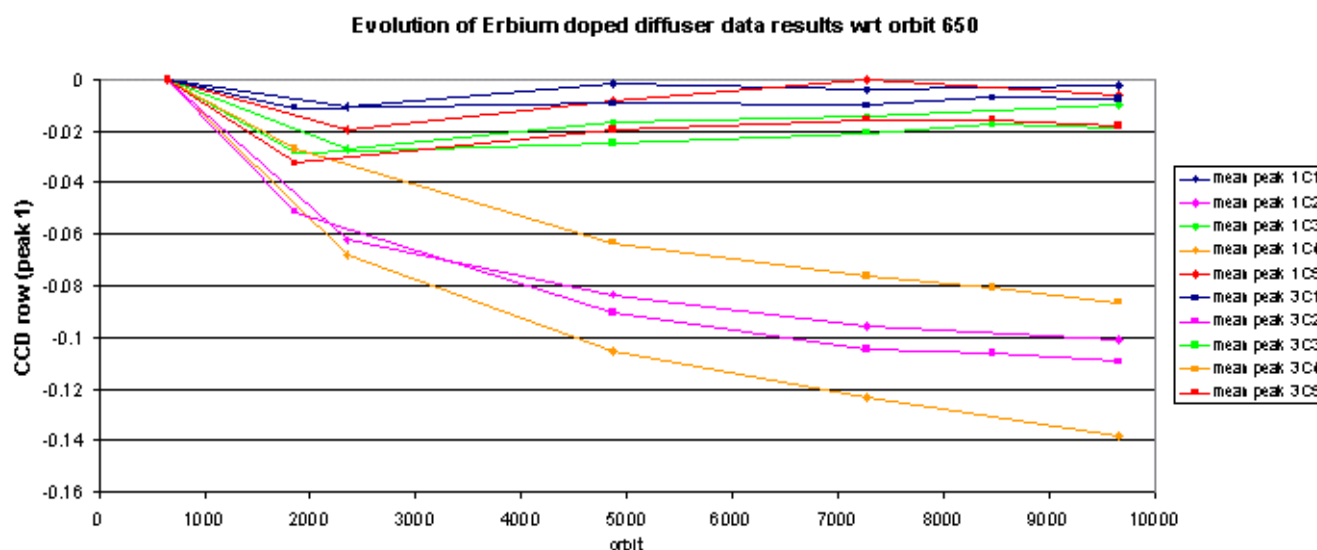
5.2.3 SMILE EFFECT

The precise characterization of the spectral dispersion law, called Smile Effect, of each of the 5 MERIS CCDs, is performed using spectral calibration data. The latest spectral calibrations show a good stability as visible from the figure below.



5.2.4 SPECTRAL EVOLUTION FROM ERBIUM MEASUREMENTS

The evolution of the spectral data acquired with the Erbium doped diffuser, computed with respect to orbit #650, shows a decreasing behaviour for cameras #2 and #4 that needs to be confirmed and investigated.



6 DATA QUALITY CONTROL

6.1 Status of the Level 1 products quality

The quality of the IPF4.07 Level 1 products is described in the following.

Radiometric quality:

4% accuracy except for some desert sites.

According to Product Handbook¹: Radiometric accuracy from 400 to 900 nm < 2%

from 900 to 1050 nm < 5%

Spectral calibration quality:

The spectral band's central wavelengths vary within the cameras field of view (< 1nm). This so-called smile effect is present in the Level 1b product where all bands are calibrated with the exact spectral characteristics of each pixel. All processing needed to minimise its impact on the geophysical products is performed in the Level 2 processing.

In order to achieve a better accuracy for the pressure retrieval, band 11, centered on the Oxygen absorption feature (761 nm), has been shifted by one pixel towards the NIR on 24-Dec-2002.

Geolocation quality:

Within the specification of 2km.

¹ <http://envisat.esa.int/dataproducts/meris/CNTR2-7-1.htm>

The Glint risk flag is showing the centre of the specular reflection within a block of $1.6^\circ \times 1.6^\circ$.

6.2 Status of the Level 2 products quality

The quality of the IPF4.07 Level 2 products is reported in the following table.

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
<i>Pixel Classification</i>					
land flag	reclassification of uncharted inland waters and islands, tidal flats and correction of map inaccuracies	ATBD 2.17 Iss. 4 Dec. 1997	All reclassifications are well, except uncharted, dark land surfaces (e.g. Fjords, intertidal areas)	08.12.04	Today band 7 is used as recommended in the ATBD. Band 13 could allow improvement with a DPM change.
water flag	as land flag		as land flag	08.12.04	
cloud flag (over ocean)	detection of clouds		Thin clouds are hardly detected.	08.12.04	Separation of ice from clouds works well when slope test is included
cloud flag (over land)			Thin clouds are hardly detected.	08.12.04	Separation of bright sand, ice, snow from clouds works well when slope tests are included.
<i>Pixel classification science flags</i>					
Pressure confidence			Not used	08.12.04	Will probably be exchanged with a new flag

² The accuracy that shall be achieved.

³ The origin of the quality goal.

⁴ Present status of quality

⁵ Date of the present status

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
Low pressure			Not used	08.12 .04	Will probably be exchanged with a new flag
<i>Cloud parameters</i>					
Surface reflectance 1-13	See L1b radiometry	QWG 25.9.03	over clouds simple conversion into TOA reflectances works well. Saturation in bands 779 and 865 can be observed – correctly flagged.	08.12 .03	An analysis of the statistics of saturated pixels based on SQADS should be performed
PCD_1_13			saturated pixel are correctly flagged	08.12 .03	
Cloud top pressure (CTP)	20 hPa	ATBD 2.3, Iss 4.1 Feb 2000	Goal is reached over strato cumulus clouds in the Passat region (30°-40°N). Elsewhere needs further validation. At low clouds camera transitions, with a step ~40 hPa, are observed.	08.12 .03	Validation campaign, e.g. with Lidar, is still required. The problem of camera interfaces is further investigated.
PCD_15			Ok	08.12 .03	Maybe it needs to be “sharpened”
Cloud albedo	accuracy of 0.01 albedo	ATBD 2.1, Iss 4.1 Feb	Ok		Limited by radiometric accuracy goal (4%).

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
		2000			No validation foreseen at present.
PCD_18			ok	08.12.03	
Cloud optical thickness	accuracy of 0.1 – 5.0 (worse with increasing OT)	ATBD 2.2, Iss. 4.2 Feb 2000	generally visually ok validation pending saturation of band 779 causes invalid COT	08.12.03	
Cloud type				08.12.03	Verification ongoing. Needs statistically significant number of products
PCD_19 (cloud opt. th. and type)			ok	08.12.03	
Water Vapour parameter					
Water vapour content (ocean)	less than 20% rel. to WV over glint: 10%	ATBD 2.4, Iss. 4.0 Dec. 1997	Ok. Quantitative error assessment not completed	08.12.03	No plan for validation for time being
PCD_14 (ocean)			Ok but strange setting on the transition to glint	08.12.03	
Water vapour content (land)	10% rel. to WV amount		Ok. Quantitative error assessment not completed	08.12.03	The water vapour products show a good agreement when comparing with GPS, radio sounding data, Microwave radiometers or MODIS data. [JF: please provide a quantitative evaluation]
PCD_14 (land)			Ok	08.12.03	

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
Water vapour content (cloud)	not specified in ATBD		ok. Quantitative error assessment not completed	08.12.03	
PCD_14 (cloud)			Ok	08.12.03	
PCD_19 (cloud opt. th. and type)			ok	08.12.03	
<i>Ocean parameter</i>					
Surface reflectance 1-13	Case1: accuracy 0.002 marine reflectance in the blue. Case2: accuracy 5%	ATBD 2.7 Iss 4.1 Feb 2000 ATBD 2.6 Iss 4.1 Feb 2000	Clear water works well at most of the validation sites. Reflectance at 681 is not corrected for smile and may be affected diversely depending on the fluorescence activity. Reflectance at 709 is corrected for smile, however gaseous absorption correction does not account for smile, which may lead to erroneous values at low	08.12.03	Dust aerosol selections may still occur where they should not (with an effect on the surface reflectance), because the tuning of the tests performed at the 510 nm band has not yet been performed (these tests are precisely dedicated to dust identification). This adjustment will require examination of numerous MERIS scenes, and may need as well some algorithmic changes. Some validation samples in coastal waters have indicated an overestimation of the surface reflectances in the blue wavelengths (bands 1 – 3, from 412 to 490 nm) leading to degraded quality of the derived water constituents and aerosol products. The problem has been

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
			reflectance levels. Case2 exhibits partly doubtful spectra, occasionally strong border between Case2 and Case1.		traced to the fact that families of aerosols generally used for the atmospheric correction over the open ocean are often not representative of coastal aerosols. Addition of new aerosols families in the processing of coastal waters may improve the quality. This is presently under test and validation. As a result neither marine reflectances, total suspended matter, chlorophyll 1 and 2 or yellow substance should be considered reliable products in coastal zones for the time being. The quality of the ozone values used for correction will be studied.
PCD_1_13			too often raised	08.12 .03	Improvement (PCD not raised under high wind conditions) implemented in match-up processing ⁶ . PCD1_13 is raised if any of the 13 water leaving reflectances is

⁶ Match-up processing is a special configuration of the MERIS prototype processor, which is used to test improvements of the actual configuration. A limited number of historic MERIS products are processed and made available to the MERIS CalVal team for evaluation

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
					negative.
Aerosol optical thickness	accuracy 15% or 0.02 for moderate values (~0.1 – 0.2)	ATBD 2.7 Iss 4.1 Feb 2000	in the expected range but overestimated by 15-20%	08.12 .03	Artificial limits may be observed in the reflectances or pigment fields, that are due to discontinuities in the optical properties of the different aerosol types used in the atmospheric correction, when this correction shifts from one aerosol family to another one, which would be significantly different one each other. This is as well under improvement. Non identified clouds will cause artificially large optical thickness.
Aerosol epsilon	not specified in ATBD	ATBD 2.6 and 2.7 Iss 4.1 Feb 2000	constantly 1.0 in Case2 over open ocean close to 1, but not constant	08.12 .03	
PCD_19 (aer. opt. th. and epsilon)			raised very often over open ocean	08.12 .03	Will be reviewed on the basis of the validation activities
Algal pigment index 1	accuracy 10 classes per decade (~13%), covered range: 0.01 – 30 mg/m ³ over Case1 waters	ATBD 2.9 Iss 4.2 Feb 2000	works well. Quantitative error assessment not completed.	08.12 .03	Algorithm is presently being optimized for high chlorophyll concentrations (> 5mg/m ³).
PCD_15			ok	08.12 .03	PCD15 is raised (among other reasons) if any of the reflectances used in the chlorophyll 1 retrieval is out of range (e.g. negative), which makes it less restrictive than

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
					PCD1_13.
Yellow substance	Depends on combination of YS, SPM and chlorophyll. See ATBD for details.	ATBD 2.12 Iss 4.0 Dec 1997	Values are in the expected range. Quantitative error assessment not completed	08.12.03	Case2 algorithm uses band 1-7 and 9, which makes it more sensitive to PCD1_13. It is very important not to use the products when PCD16 or PCD17 are raised! PCDs 16 and 17 are raised almost everywhere in Case1 waters, which is in agreement with the definition range for the algorithm.
Total suspended matter			suffers from atmospheric correction over coastal zones	08.12.03	
PCD_16 (YS and TSM)			Ok.		
Algal pigment index II			suffers from atmospheric correction over coastal zones	08.12.03	
PCD_17			ok.	08.12.03	
PAR	accuracy +/- 3%	ATBD 2.18 Iss 4.0 Dec 1997	Value range and tendency ok	01.9.03	
PCD_18			ok	08.12.03	

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
<i>Ocean Science Flags</i>					
Absorbing continental aerosol	Only relevant for Case1 water. Shall indicate the potential presence.		unknown	08.12.03	Investigation in progress.
Absorbing dust aerosol	Only relevant for Case1 water. Shall indicate the potential presence.		unknown	08.12.03	Investigation in progress.
Case2_S			Ok.	08.12.03	Not severe enough. Threshold will be lowered.
Case2_anom			Suspect	08.12.03	Under investigation
Case2_Y			Not activated	08.12.03	
Ice and haze			Not activated	08.12.03	All bright pixel are presently identified as clouds. Will be changed.
Medium glint	Indicate atmospheric correction could still be possible.	QWG 25.9.03	Ok. Users should use the products with caution under medium glint conditions	08.12.03	Large portions of the images over water surfaces are affected by sun glint. Threshold for high glint is based on simulated data.
High glint	Indicate that atmospheric correction cannot be performed with the claimed accuracy.	QWG 25.9.03	Ok. Users should not use Level 2 data when the high glint flag is raised	08.12.03	
<i>Land Parameter</i>					

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
Surface reflectance 1-13			Ok	08.12.03	Correction includes Rayleigh but not aerosol correction. Visually correct and in agreement with expectations.
PCD_1_13			Ok	08.12.03	Cloud shadows are not included in PCD1_13 but in TOAVI_WS
Aerosol optical thickness			Ok	08.12.03	In agreement with expectations. Tuning and validation with in-situ is ongoing. The need to include more aerosol models has been identified.
Aerosol epsilon			Ok	08.12.03	
PCD_19 (aer. opt. thk. and eps)			ok	08.12.03	
TOAVI (MGVI)	not specified in ATBD	ATBD 2.10 Iss 4.1 Feb 2000	ok	08.12.03	Validation is ongoing
PCD_15			ok	08.12.03	Validation is ongoing
BOAVI	Not specified	No ATBD for BOAVI available	Ok	08.12.03	The BOAVI is calculated from top of aerosol reflectances.
PCD_17			Ok	08.12.03	
Rectified reflectances			Ok	08.12.03	
PCD_16			Ok	08.12.03	
Surface pressure			Generally ok, camera interfaces and striping visible	08.12.03	The problem of camera interfaces is further investigated.
PCD_18			Ok	08.12.03	could be more “sharp”: only P_surf>1047 are flagged by the out-of-range criterion, but 1030 < P < 1047 is also

Parameter	Quality				Comment
	Goal ²	Source ³	Status ⁴	Date ⁵	
					quite high and can be found not rarely in images
Land Science Flags					
DDV			Ok	08.12.03	A study is presently undertaken to extend the concept of DDV in order to increase the temporal and spatial extend, so that aerosol properties will be retrieved over more pixel.
TOAVI_Bright			Ok	08.12.03	
TOAVI_Bad			Ok	08.12.03	
TOAVI_CSI			Not activated	08.12.03	All bright pixel are presently identified as clouds. Will be changed.
TOAVI_WS			Ok	08.12.03	
TOAVI_Invalid_Rec			Ok	08.12.03	
Additional Flags					
Coastline			Ok	08.12.03	Coastline is taken from a static map and not reclassified using radiometry
Cosmetic			Ok	08.12.03	
Suspect			Ok	08.12.03	

6.3 Anomalies

- Despite the processor upgrade done during cycle #22 to fix the problem, some MERIS FR L1 products still show the following anomalies: null radiance values for all the 15 bands and the 1st Tie Point of the product with latitude and longitude values out of the actual product geolocalization. The problem seem to be related to the Orbit State Vector, OSV: an OSV given at product start time and not at Ascending Node Cross, ANX, time prevent correct computation of the FR product limits that constrain all further processing including data extraction. A patch to IPF 4.07 is now under test to properly manage the geo-location step in FR L1 processing.
- Some MERIS FR L2 products show negative reflectance values above water pixels and corrupted marine geophysical parameters. It has been verified that the auxiliary products used for the L2 processing are good and that the quality of the corresponding L1 products is OK. The problem is still under investigation.
- In MERIS RR L2 products the Water Vapour field is characterized by a vertical feature, which lies quite in the center of the image and regards only water pixels. Above those pixels the water vapour content has negative value and both the HIGHGLINT and PCD_14 flags are raised. The L2 processing done with the prototype, megs6.2p3, does not reproduce the same anomaly, then the problem could be due to an implementation error in the processor, which is now under investigation.
- A lot of MERIS RR L1 products processed at Kiruna station in the period 15–30 January 2004 are affected by CRC errors due to transmission problems, small data gaps (~20s) and big data gaps (~270s) due to hardware and software problems. The affected orbits have been planned to be reprocessed.

6.4 Software Problem Reporting (SPR)

Open anomaly/observation reports:

1. MER_FR__L1 products: all radiometric data set to zero. See par. 6.3 for more details.
2. MER_FR__L2 products: bad reflectance values above water pixels and corrupted marine products. See par. 6.3 for more details.
3. MER_RR__2P products: vertical feature observed in Water Vapour. See par. 6.3 for more details.

7 VALIDATION ACTIVITIES AND RESULTS

No new validation results to be shown for the cycle.

7.1 Processor upgrade

A new processor upgrade is foreseen for next June-July 2004, including several changes in the level 2 processing chain as suggested from the MAVT and the QWG. All the changes will be fixed by mid March 2004, in order to start the re-processing activities that shall regard MERIS products acquired from March 2002 until June-July 2004. All the reprocessed data will be made available by summer 2004.

The most important modifications, sorted by processing branches, should be the following:

- Pre-processing

1. Review of the parameters used in the generation of the gaseous corrections LUTs: increase the number of Legendre expansion terms
2. Accounting for Smile effect within the H₂O absorption correction (at 709nm)

- Pressure computation

1. Modify surface pressure retrieval through a polynomial expression of $\log(MP^2)$ instead of MP^2 as currently done

- Water Vapour retrieval

1. LUT update for water vapour over the ocean (including wind dimension)

- Land Branch

1. Land Aerosol: ARVI vs reflectance improvements, extension of the number of aerosol models
2. Replace NDVI by MTCI (from top of aerosol reflectance as well)
3. Cloud shadow screening
4. DDV database revision
5. Two-bands land in water re-classification

- Water branch

1. Add to the Medium Glint sub-branch a High aerosol/ice screening (same as already exist in the “no glint” sub-branch)
2. Modify Glint Correction to include aerosol influence in the computation of the glint corrected reflectance in the blue (IR bands used in AC are glint corrected prior to AC, hence without aerosol, but visible bands are corrected for glint after aerosol retrieval, thus increasing correction quality)
3. Additional bright screening (at 412nm)

- AC over bright waters

1. Code BPAC as per July 2003 match-up processing but from LUTs.

- AC over clear waters

1. Modify definition of PCD_1_13, PCD_15 and PCD_17
2. Review logic of atmospheric correction over ocean. Basically allow all aerosols except dust-like and blue ones in the first pass. Second pass triggered for dust-like by test at 510 (remove test at 709, by-pass test at 510 for non-case 1 waters). A significant number of aerosol assemblages have to be redefined/regenerated.
3. If optical thickness of aerosol too small, switch to standard aerosol.
4. Modify the DUST_LIKE test at 510 to use a climatology instead of a single value.

7.2 Water Vapour and Browse maps

Water Vapour data, retrieved from MER_LRC_2P products, have been used to generate global coverage maps for each day of the cycle. Maps are available on the ESA website:

<http://earth.esa.int/pcs/envisat/meris/maps/watervapour/>

MERIS tracks for each day of the cycle have been plotted using Browse products. Maps are available on the ESA website:

<http://earth.esa.int/pcs/envisat/meris/maps/browse/>

8 GENERAL INFORMATION

- A prototype upgrade is foreseen for mid March 2004, following indications coming from the MAVT and the QWG. The reprocessing of MERIS products is going to take place as soon as the new configuration is available.
- The 2004 ENVISAT Symposium follows the previous successful Symposia in Gothenburg (2000), Florence (1997), Hamburg (1993) and Cannes (1992). ESA would like to invite you to participate in the ENVISAT Symposium, to be held in Salzburg (Austria) from 6 to 10 September 2004. For detailed information see the ESA's official conference page: <http://www.congrex.nl/04a06/>.