Mauritania Coast, Africa, 14th March 2012 (image courtesy of ESA)

MERIS CYCLIC REPORT #112
19th February 2012 – 20th March 2012

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<table>
<thead>
<tr>
<th>author</th>
<th>J. Jackson</th>
</tr>
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<tr>
<td>C. Kent</td>
<td></td>
</tr>
<tr>
<td>A. Borg</td>
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</table>

| date         | 03/04/2012  |

## CHANGE LOG

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<th>revision / revision</th>
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## CHANGE RECORD

Issue: 1 Revision: 0

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1. INTRODUCTION

The MERIS Cyclic Report (CR) is distributed by ESRIN- SPPA (Sensor Performance Products and Algorithms) to keep the MERIS Community informed of any modification regarding the processor, updates of auxiliary products, behavioural anomalies of the instrument, data acquisition and processing, and the status of the Calibration, Validation, and Quality Control activities.

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

- ESRIN- Product Control Facility (PCF)
- Quality Working Group (QWG)
- MERIS Validation Team (MVT)
- Brockmann Consult (BC)
- ACRI-ST
- ARGANS Ltd
- Laboratoire d’Océanographie de Villefranche (LOV)
- Centre National d’Études Spatiales (CNES)
- Frei Universität Berlin (FUB)
- Laboratoire Interdisciplinaire en Sciences de l'Environnement (LISE)

The main objective of the Cyclic Report is to provide the user community with useful information regarding the performance of the instrument, the data production chain and the results of calibration activities and validation campaigns. The Cyclic Report is produced at the end of each ENVISAT Cycle, which following the E2010+ Orbit manoeuvre during October 2010, represents 431 orbits (approximately 30 days).
1.1 Acronyms and abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADF</td>
<td>Auxiliary Data File</td>
</tr>
<tr>
<td>ADS</td>
<td>Auxiliary Data Server</td>
</tr>
<tr>
<td>AOC</td>
<td>Attitude and Orbit Control (ARTEMIS)</td>
</tr>
<tr>
<td>APC</td>
<td>Antenna Pointing Controller (ARTEMIS)</td>
</tr>
<tr>
<td>ARTEMIS</td>
<td>The Advanced Relay and TEchnology MISsion satellite</td>
</tr>
<tr>
<td>ARF</td>
<td>Archiving Facility (PDS)</td>
</tr>
<tr>
<td>CNES</td>
<td>Centre National d’Études Spatiales</td>
</tr>
<tr>
<td>CTI</td>
<td>Configuration Table Interface</td>
</tr>
<tr>
<td>CR</td>
<td>Cyclic Report</td>
</tr>
<tr>
<td>DAC</td>
<td>Diffuser Ageing Calibration</td>
</tr>
<tr>
<td>DMOP</td>
<td>Detailed Mission Operation Plan</td>
</tr>
<tr>
<td>DOY</td>
<td>Day Of Year</td>
</tr>
<tr>
<td>DS</td>
<td>Data Server</td>
</tr>
<tr>
<td>DSD</td>
<td>Data Set Descriptor</td>
</tr>
<tr>
<td>EDAC</td>
<td>Error Detection and Correction</td>
</tr>
<tr>
<td>ESRIN</td>
<td>European Space Research INstitute</td>
</tr>
<tr>
<td>FOV</td>
<td>Field Of View</td>
</tr>
<tr>
<td>FUB</td>
<td>Freie Universitat Berlin</td>
</tr>
<tr>
<td>GS</td>
<td>Ground Segment</td>
</tr>
<tr>
<td>IAT</td>
<td>Interactive Analysis Tool</td>
</tr>
<tr>
<td>IDL</td>
<td>Interactive Data Language</td>
</tr>
<tr>
<td>IECF</td>
<td>Instrument Engineering and Calibration Facilities</td>
</tr>
<tr>
<td>IPF</td>
<td>Instrument Processing Facilities (PDS)</td>
</tr>
<tr>
<td>INV</td>
<td>Inventory Facilities (PDS)</td>
</tr>
<tr>
<td>JRC</td>
<td>Joint Research Centre</td>
</tr>
<tr>
<td>LAN</td>
<td>Local Area Network</td>
</tr>
<tr>
<td>LARS</td>
<td>Land Aerosol Remote Sensing</td>
</tr>
<tr>
<td>LISE</td>
<td>Laboratoire Interdisciplinaire en Sciences de l'Environnement</td>
</tr>
<tr>
<td>LOV</td>
<td>Laboratoire d'Océanographie de Villefranche-sur-Mer</td>
</tr>
<tr>
<td>LUT</td>
<td>Look Up Table</td>
</tr>
<tr>
<td>MERIS</td>
<td>Medium Resolution Image Spectrometer</td>
</tr>
<tr>
<td>MPH</td>
<td>Main Product Header</td>
</tr>
<tr>
<td>OP</td>
<td>Operational Phase of ENVISAT</td>
</tr>
<tr>
<td>OCL</td>
<td>Offset Control Loop</td>
</tr>
<tr>
<td>OCM</td>
<td>Orbit Control Manoeuvre</td>
</tr>
<tr>
<td>PAC</td>
<td>Processing and Archiving Centre (PDS)</td>
</tr>
<tr>
<td>PDCC</td>
<td>Payload Data Control Centre (PDS)</td>
</tr>
<tr>
<td>PDHS</td>
<td>Payload Data Handling Station (PDS)</td>
</tr>
<tr>
<td>PDS</td>
<td>Payload Data Segment</td>
</tr>
<tr>
<td>PEP</td>
<td>Payload Exploitation Plan</td>
</tr>
</tbody>
</table>
2. SUMMARY

Cycle #112 began on 19th February 2012 (DOY 050) and ended on 20th March 2012 (DOY 080). Details about the Cycle can be found in Table 1 below:

<table>
<thead>
<tr>
<th>Cycle number</th>
<th>#112</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start time</td>
<td>19th February 2012, 22:04:33</td>
</tr>
<tr>
<td>Stop time</td>
<td>20th March 2012, 22:04:34</td>
</tr>
<tr>
<td>Start orbit</td>
<td>52170</td>
</tr>
<tr>
<td>Stop orbit</td>
<td>52600</td>
</tr>
</tbody>
</table>

Table 1 – Cyclic Characteristics
3. PROCESSOR VERSION AND PROCESSOR CONFIGURATION

3.1 MERIS Processor Release

During Cycle #112, there were no changes to the MERIS processor configuration.

<table>
<thead>
<tr>
<th>IPF Version</th>
<th>Validity</th>
<th>Reference Documents</th>
</tr>
</thead>
</table>
| 6.04        | 3rd November 2011 | 1. ENVISAT Product Specification [Iss_6_Rev_A]  
              | Reduced Resolution NRT: ESRIN → #50617 Kiruna → #50607 | 2. MERIS Input/output Data Definition [Iss_8_Rev_0a]  
              | Full Resolution NRT: ESRIN → #50612 Kiruna → #50609 | 3. MERIS Level 1b Detailed Processing Model [Iss_8_Rev_0]  

Table 2 – MERIS Processor Parameters – version 6.04

- Auxiliary data files (ADF)

<table>
<thead>
<tr>
<th>Product description</th>
<th>Product name</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level 1 AUX Files</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instrument Characterization Data</td>
<td>MER_INS</td>
<td>No change</td>
</tr>
<tr>
<td>Processing Level 1 Control Parameters data</td>
<td>MER_CP1</td>
<td>No change</td>
</tr>
<tr>
<td>Radiometric Calibration data</td>
<td>MER_RAC</td>
<td>No change</td>
</tr>
<tr>
<td>Digital Roughness Model</td>
<td>MER_DRM</td>
<td>No change</td>
</tr>
<tr>
<td>Digital Elevation Model</td>
<td>AUX_DEM</td>
<td>No change</td>
</tr>
<tr>
<td>Land Surface Map</td>
<td>AUX_LSM</td>
<td>No change</td>
</tr>
<tr>
<td>Attitude data file</td>
<td>AUX_ATT</td>
<td>No change</td>
</tr>
<tr>
<td>Level 2 AUX Files</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aerosol Climatology data</td>
<td>MER_AER</td>
<td>No change</td>
</tr>
<tr>
<td>Atmosphere Parameter data</td>
<td>MER_ATP</td>
<td>No change</td>
</tr>
<tr>
<td>Cloud Measurement Parameters data</td>
<td>MER_CMP</td>
<td>No change</td>
</tr>
<tr>
<td>Processing Level-2 Control Parameters data</td>
<td>MER_CP2</td>
<td>No change</td>
</tr>
<tr>
<td>Land Aerosols Parameters data</td>
<td>MER_LAP</td>
<td>No change</td>
</tr>
<tr>
<td>Land Vegetation Index parameters data</td>
<td>MER_LVI</td>
<td>No change</td>
</tr>
<tr>
<td>Ocean Aerosols Parameters data</td>
<td>MER_OAP</td>
<td>No change</td>
</tr>
<tr>
<td>Ocean I parameters data</td>
<td>MER_OC1</td>
<td>No change</td>
</tr>
<tr>
<td>Ocean II parameters data</td>
<td>MER_OC2</td>
<td>No change</td>
</tr>
<tr>
<td>Surface Confidence Map</td>
<td>MER_SCM</td>
<td>No change</td>
</tr>
<tr>
<td>Water Vapour Parameters</td>
<td>MER_WVP</td>
<td>No change</td>
</tr>
</tbody>
</table>

Table 3 – Auxiliary Data Files in use for Cycle #112
3.2 Level 1/Level 2 Configuration (SciHiO2)

The current operational ADF files, used in the processing from Level 0 data to Level 1b or Level 2 products, are listed in the following tables (Tables 4 & 5).

- **Level 1 ADF configuration**:

<table>
<thead>
<tr>
<th>Product name</th>
<th>Start Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUX_ATT_AXVIEC20020924_131534_20020703_120000_20781231_235959</td>
<td>03/07/2002</td>
</tr>
<tr>
<td>AUX_DEM_AXVIEC20031201_000000_20031201_000000_20200101_000000</td>
<td>01/12/2003</td>
</tr>
<tr>
<td>AUX_LSM_AXVIEC20080218_104630_20020101_000000_20200101_000000</td>
<td>01/01/2002</td>
</tr>
<tr>
<td>MER_CP1_AXVACR20091015_130410_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_DRM_AXVIEC20020122_083343_20020101_000000_20200101_000000</td>
<td>01/01/2002</td>
</tr>
<tr>
<td>MER_INS_AXVACR20080826_192134_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_RAC_AXVACR20091023_105043_20020429_041400_20021224_121445</td>
<td>29/04/2002</td>
</tr>
<tr>
<td>MER_RAC_AXVACR20091016_154511_20021224_121445_20041213_220000</td>
<td>24/12/2002</td>
</tr>
<tr>
<td>MER_RAC_AXVACR20091016_154106_20061009_220000_20061009_220000</td>
<td>13/12/2004</td>
</tr>
<tr>
<td>MER_RAC_AXVACR20091008_180000_20061009_220000_20020101_000000</td>
<td>09/10/2006</td>
</tr>
</tbody>
</table>

  Table 4 – MERIS Level 1 Auxiliary Data Files

- **Level 2 ADF configuration**:

<table>
<thead>
<tr>
<th>Product name</th>
<th>Start Validity</th>
</tr>
</thead>
<tbody>
<tr>
<td>MER_AER_AXVIEC20040407_174356_20020321_193100_20120321_193100</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_ATP_AXVACR20091026_144725_20021224_121445_20200101_000000</td>
<td>24/12/2002</td>
</tr>
<tr>
<td>MER_CMP_AXVACR20100128_180324_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_CP2_AXVACR20110124_142451_20020429_041400_20021224_121445</td>
<td>29/04/2002</td>
</tr>
<tr>
<td>MER_CP2_AXVACR20110124_141903_20021224_121445_20200101_000000</td>
<td>24/12/2002</td>
</tr>
<tr>
<td>MER_LAP_AXVACR20100610_190333_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_LVI_AXVACR20100511_180029_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_OAP_AXVACR20110127_161245_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_OC1_AXVACR20110113_160338_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
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<tr>
<td>MER_OC2_AXVACR20100709_165829_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_SCM_AXVIEC20110726_141400_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
<tr>
<td>MER_WVP_AXVACR20090710_110951_20020321_193100_20200101_000000</td>
<td>21/03/2002</td>
</tr>
</tbody>
</table>

  Table 5 – MERIS Level 2 Auxiliary Data Files
3.3 Configuration Table Interface (CTI)

No new CTIs were disseminated during Cycle #112.

3.4 Level 1/ Level 2 RR or FR products

No format changes or algorithm modifications regarding MERIS RR and FR products were implemented into the operational processor during Cycle #112.

REMINDER:

On 3rd November 2011 the MERIS NRT processor was upgraded to version 6.04. This processor version is equivalent to the MERIS Ground Segment (MEGS) Processor Version 8.0 used for the 3rd reprocessing of the MERIS archive. The main algorithm improvements include:

Level 1:

- Updated radiometric model and coefficients

Level 2:

- Revised pixel classification and flagging
- Vicarious adjustment of Marine Reflectances
- New Bright Pixel Atmospheric Correction (BPAC) algorithm
- Updated Radiative Transfer LUTs and interpolation methodologies
- New Case_2 waters atmospheric correction for Algal_2, TSM and Yellow substance products
- New Water Vapour retrieval over land algorithm
- New Surface Pressure algorithm over Land

In addition to these changes, an update to the Level 2 flag coding has also been implemented.

Detailed information on all of the changes implemented for IPF 6.04 and MEGS 8.0 can be found online at:

1. The MERIS PCS website: [http://earth.eo.esa.int/pcs/envisat/meris/documentation/](http://earth.eo.esa.int/pcs/envisat/meris/documentation/)
2. The MERIS Product Handbook website: [http://envisat.esa.int/handbooks/meris/](http://envisat.esa.int/handbooks/meris/)
4. PDS STATUS

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

4.1 MERIS Level 0 products availability

Table 6 shows the statistics regarding the RR L0 availability (compared to the planned production). The format of Table 6 and Figure 1 reflects the aggregated data for the 5 weeks of the reporting period. Week 1 starts 19th February 2012, 22:04:33 (orbit #52170). Week 5 ends 20th March 2012, 22:04:34 (orbit #52600).

<table>
<thead>
<tr>
<th>Week</th>
<th>MER_RR_0P%</th>
<th>Inventoried</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>98.54</td>
<td>1.46</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>97.02</td>
<td>2.98</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>97.45</td>
<td>2.55</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>98.73</td>
<td>1.27</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>98.56</td>
<td>1.44</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 – Reduced Resolution Level 0 products percentage availability

Figure 1 – MER_RR__0P generated/missing by the ground segment during Cycle #112
Table 7 shows the statistics regarding the FR L0 availability (compared to the planned production). The format of Table 7 and Figure 2 reflects the aggregated data for the 5 weeks of the reporting period. Week 1 starts 19th February 2012, 22:04:33 (orbit #52170). Week 5 ends 20th March 2012, 22:04:34 (orbit #52600).

<table>
<thead>
<tr>
<th>Week</th>
<th>MER_FR_0P%</th>
<th>Inventoried</th>
<th>Missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>100</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 7 – Full Resolution Level 0 products percentage availability

Figure 2 – MER_FR_0P generated/missing by the ground segment during Cycle #112
4.2 MERIS FR acquisitions

The Figure below shows the MERIS Full Resolution global coverage for the reporting period. This is the predicted Background Regional Mission (BRM) image and is subject to change due to conflicts with user planning requests, satellite resource availability and service interruption.

![Figure 3 - MERIS Full Resolution BRM – Cycle #112](image)

4.3 MER_CA__0P Products

During the Reporting Period, the following Calibration campaigns were successfully completed:

- A Radiometric Calibration was successfully executed on Sunday 26\textsuperscript{th} February 2012 (DOY 057) during Orbit #52261.
- A Diffuser Ageing Calibration was successfully executed on Sunday 11\textsuperscript{th} March 2012 (DOY 071) during Orbits #52459-52460.
- A Wavelength Type-2 Calibration was successfully executed on Sunday 11\textsuperscript{th} March 2012 (DOY 071) during Orbits #52461-52464.

With the following calibration file:
MPL_CAL_MEVRGT20101022_080316_00000000_00000007_20101027_001433_20781231_235959.N1
5. INSTRUMENT/DATA UNAVAILABILITY

5.1 Instrument Unavailability

Table 8 (below) sets out the total number of EDAC-corrected Single Event Upsets (SEU) for Cycle #112. The entries in **bold** are SEU outside the SAA:

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Lon.</th>
<th>Lat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2012.051.01.18.36</td>
<td>44.3388° W</td>
<td>22.8305° S</td>
</tr>
<tr>
<td>2 2012.051.01.21.56</td>
<td>47.1059° W</td>
<td>10.9498° S</td>
</tr>
<tr>
<td>3 2012.052.11.42.12</td>
<td>25.1618° W</td>
<td>9.0069° S</td>
</tr>
<tr>
<td>4 2012.052.13.23.04</td>
<td>50.7252° W</td>
<td>11.2732° S</td>
</tr>
<tr>
<td>5 2012.053.03.22.40</td>
<td>73.3913° W</td>
<td>33.0915° S</td>
</tr>
<tr>
<td>6 2012.054.01.50.52</td>
<td>134.2909° E</td>
<td><strong>50.2800° N</strong></td>
</tr>
<tr>
<td>7 2012.054.02.45.34</td>
<td>63.8511° W</td>
<td>34.3257° S</td>
</tr>
<tr>
<td>8 2012.054.12.12.28</td>
<td>34.7507° W</td>
<td>21.6226° S</td>
</tr>
<tr>
<td>9 2012.055.00.35.50</td>
<td>35.9509° W</td>
<td>8.5359° S</td>
</tr>
<tr>
<td>10 2012.056.12.38.17</td>
<td>40.6564° W</td>
<td>18.3547° S</td>
</tr>
<tr>
<td>11 2012.056.23.20.07</td>
<td>15.7880° W</td>
<td>16.4578° S</td>
</tr>
<tr>
<td>12 2012.057.02.39.18</td>
<td>64.8281° W</td>
<td>21.0229° S</td>
</tr>
<tr>
<td>13 2012.057.13.36.48</td>
<td>52.5592° W</td>
<td>0.6157° S</td>
</tr>
<tr>
<td>14 2012.058.00.21.35</td>
<td>29.9401° W</td>
<td>23.6472° S</td>
</tr>
<tr>
<td>15 2012.058.13.00.45</td>
<td>43.9136° W</td>
<td>3.1008° S</td>
</tr>
<tr>
<td>16 2012.058.13.11.39</td>
<td>53.8067° W</td>
<td>41.8439° S</td>
</tr>
<tr>
<td>17 2012.059.01.28.06</td>
<td>48.3529° W</td>
<td>12.8518° S</td>
</tr>
<tr>
<td>18 2012.059.12.23.30</td>
<td>34.3335° W</td>
<td>1.2986° S</td>
</tr>
<tr>
<td>19 2012.059.14.08.46</td>
<td>63.4284° W</td>
<td>19.2700° S</td>
</tr>
<tr>
<td>20 2012.061.12.55.10</td>
<td>44.9635° W</td>
<td>17.4778° S</td>
</tr>
<tr>
<td>21 2012.062.01.16.48</td>
<td>44.7908° W</td>
<td>17.4778° S</td>
</tr>
<tr>
<td>22 2012.062.14.01.17</td>
<td>63.1514° W</td>
<td>28.2287° S</td>
</tr>
<tr>
<td>23 2012.062.14.02.41</td>
<td>64.5019° W</td>
<td>33.1917° S</td>
</tr>
<tr>
<td>24 2012.064.12.46.05</td>
<td>43.2456° W</td>
<td>22.1439° S</td>
</tr>
<tr>
<td>25 2012.064.14.27.50</td>
<td>69.6575° W</td>
<td>27.5379° S</td>
</tr>
<tr>
<td>26 2012.065.15.30.13</td>
<td>84.5338° W</td>
<td>23.6310° S</td>
</tr>
<tr>
<td>27 2012.066.13.11.47</td>
<td>49.0403° W</td>
<td>18.4504° S</td>
</tr>
<tr>
<td>28 2012.066.23.49.51</td>
<td>20.8546° W</td>
<td>29.7581° S</td>
</tr>
<tr>
<td>30 2012.068.08.37.04</td>
<td>20.0793° W</td>
<td>15.7485° S</td>
</tr>
<tr>
<td>31 2012.068.11.56.14</td>
<td>28.9851° W</td>
<td>11.1173° S</td>
</tr>
<tr>
<td>32 2012.068.13.42.25</td>
<td>59.2400° W</td>
<td>32.2927° S</td>
</tr>
<tr>
<td>33 2012.069.00.20.08</td>
<td>30.6657° W</td>
<td>17.1495° S</td>
</tr>
<tr>
<td>34 2012.069.00.48.53</td>
<td><strong>105.8350° W</strong></td>
<td><strong>80.7307° N</strong></td>
</tr>
<tr>
<td>35 2012.069.03.38.59</td>
<td>79.4094° W</td>
<td>22.8986° S</td>
</tr>
<tr>
<td></td>
<td>Date</td>
<td>Longitude</td>
</tr>
<tr>
<td>----</td>
<td>---------------</td>
<td>------------</td>
</tr>
<tr>
<td>36</td>
<td>2012.070.01.22.09</td>
<td>45.2922° W</td>
</tr>
<tr>
<td>37</td>
<td>2012.070.03.04.07</td>
<td>71.8152° W</td>
</tr>
<tr>
<td>38</td>
<td>2012.070.10.46.23</td>
<td>13.6587° W</td>
</tr>
<tr>
<td>40</td>
<td>2012.071.11.40.18</td>
<td>21.8261° W</td>
</tr>
<tr>
<td>41</td>
<td>2012.071.13.29.29</td>
<td>54.0496° W</td>
</tr>
<tr>
<td>42</td>
<td>2012.072.00.09.24</td>
<td>27.5641° W</td>
</tr>
<tr>
<td>43</td>
<td>2012.072.12.51.50</td>
<td>44.0969° W</td>
</tr>
<tr>
<td>44</td>
<td>2012.072.16.07.32</td>
<td>90.3939° W</td>
</tr>
<tr>
<td>45</td>
<td>2012.072.23.32.56</td>
<td>18.6128° W</td>
</tr>
<tr>
<td>46</td>
<td>2012.073.01.14.56</td>
<td>45.1216° W</td>
</tr>
<tr>
<td>47</td>
<td>2012.073.02.49.10</td>
<td>64.8679° W</td>
</tr>
<tr>
<td>48</td>
<td>2012.073.02.51.20</td>
<td>66.9343° W</td>
</tr>
<tr>
<td>49</td>
<td>2012.074.13.19.55</td>
<td>51.9349° W</td>
</tr>
<tr>
<td>50</td>
<td><strong>2012.075.17.29.57</strong></td>
<td><strong>106.5647° W 26.1244° N</strong></td>
</tr>
<tr>
<td>51</td>
<td>2012.075.23.25.31</td>
<td>18.2180° W</td>
</tr>
<tr>
<td>52</td>
<td>2012.077.03.46.08</td>
<td>81.4652° W</td>
</tr>
<tr>
<td>53</td>
<td>2012.077.09.48.54</td>
<td>1.1586° E</td>
</tr>
<tr>
<td>54</td>
<td>2012.078.03.05.38</td>
<td>68.7771° W</td>
</tr>
<tr>
<td>56</td>
<td>2012.079.00.51.44</td>
<td>37.4452° W</td>
</tr>
<tr>
<td>57</td>
<td>2012.079.13.36.53</td>
<td>56.3212° W</td>
</tr>
<tr>
<td>58</td>
<td>2012.079.20.53.47</td>
<td>22.5179° E</td>
</tr>
<tr>
<td>59</td>
<td>2012.080.12.58.21</td>
<td>45.5989° W</td>
</tr>
</tbody>
</table>

Table 8 – EDAC-corrected Single Event Upsets (SEU) for Cycle #112
5.2 Data Unavailability

The following data unavailability occurrences have been reported during Cycle #112:

Flight Segment anomalies:-

- On 1st March 2012 (DOY 061) at 09:16:10z MERIS SDPSS unexpectedly switched to PAUSE mode (REF AR ENV_SC_911). Normal operations resumed at 09:16:39z

- On 17th March 2012 (DOY 077) at 11:09:30z MERIS SDPSS unexpectedly switched to ANOMALY mode (REF AR ENV_SC_841). Normal operations resumed at 11:10:34z

Ground Segment anomalies:-

- None.
6. CALIBRATION AND INSTRUMENT CHARACTERIZATION

6.1 Calibration

6.1.1 Radiometric Calibration

Cycle #112 radiometric calibrations are detailed in Subsection 4.3.

6.1.2 Spectral Calibration

Cycle #112 spectral calibrations (Wavelength Type 1 or 2) are detailed in Subsection 4.3.

6.1.3 Geolocation

The accuracy specification for MERIS geolocation is 2000 metres, with an operational goal of 150 metres. The 290 metre (nadir) bands 2, 5, 8 are used to estimate the absolute accuracy of geolocation.

This analysis shows significant improvements since launch, with one major upgrade, which occurred in 2003 DOY (Day of Year) 343. The update of the star tracker has been performed in order to reduce the systematic offset and improve orientation parameters. Global absolute geolocation error (North and South hemispheres) for the three consecutive periods can be summarized as follows:

(I) Initially, after the launch, according to results related to the 2002 period, the geolocation accuracy is in the order of ±135 metres along-track and ±207 metres across-track. The RMS absolute geolocation error stays within the range of 251.24 ± 81 metres.

(II) The 2003 period is characterised by a degradation of the absolute geolocation accuracy where error is around ±209 metres along-track and ±295 metres across-track. For this period, the RMS absolute geolocation error stays within the range of 368.39 ± 67 metres.

(III) After the update, 2004 period, MERIS geolocation is achieving the goal of 300 metres with accuracy of ± 132 metres along-track and ± 165 metres across-track. The RMS absolute geolocation error remains within the range of 212 ± 22 metres.

When correcting products from the systematic offset (centred results), for the 2004 period the RMS absolute geolocation error stays within the range of 166 ± 18 metres. The amount of products located on northern hemisphere is much larger than the one from the Southern hemisphere. Comparison between the two sets of results is not trivial. For the 2004 period, this study demonstrated the temporal stability of the absolute geolocation. More results are now needed to confirm this trend. For more details, refer to the Gael Consultant (Fr) report available on the ESA website: http://earth.esa.int/pcs/envisat/meris/reports/
6.1.4 Video Electronic Unit Temperature Analysis

During one of the operation modes of MERIS (Stabilization mode), a thermal regulation of the VEU is performed. This is carried out in order to both stabilise its temperature and to reach optimum performance levels, thereby ensuring a smooth and safe transition towards Observation and Calibration modes.

During observation, in order to meet the image quality requirements, the VEU temperature has to remain in the operationally acceptable temperature range of -10°C/+50°C. Furthermore, to ensure optimum performance levels of the instrument, the variation in VEU maximum and minimum temperature values should not differ more or less than 10°C (±10°C) from the previous radiometric calibration.

![Graph showing VEU Temperature during Cycle #112](image)

**Figure 4 – VEU Temperature during Cycle #112**

*Note, peak in temperature on 11th March 2012 is due to the executed Diffuser Ageing and Wavelength Type-2 calibrations.*

6.1.5 Vicarious calibration results

For absolute calibration of MERIS by vicarious methods, METRIC2.0 tools are 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-dimensional 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 which stores all parameters necessary for data filtering (cloud and aerosol screening, distance from coast etc.). 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.

A map showing Calibration Sites used is given in Figure 5:

![METRIC Vicarious Calibration Sites](image)

**Figure 5 – Map of METRIC Calibration Sites**

During Cycle #112, METRIC has generated the following results for specific sites:

<table>
<thead>
<tr>
<th>Sites</th>
<th># Number of METRIC output</th>
<th># Submitted child L1b</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desert</td>
<td>61</td>
<td>29</td>
</tr>
<tr>
<td>Glitter</td>
<td>36</td>
<td>36</td>
</tr>
<tr>
<td>Rayleigh</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Snow</td>
<td>47</td>
<td>47</td>
</tr>
<tr>
<td>Buoy</td>
<td>43</td>
<td>33</td>
</tr>
</tbody>
</table>

**Table 9 – METRIC Table for Cycle #112**

Please note, METRIC data were unavailable at the time of the writing of this report.

Corresponding presentations can be found at:

- [http://envisat.esa.int/workshops/mavt_2006/MAVT-2006-0303_C Tinel.pdf](http://envisat.esa.int/workshops/mavt_2006/MAVT-2006-0303_C Tinel.pdf)
- [http://envisat.esa.int/workshops/mavt_2006/MAVT-2006-0304_C Tinel.pdf](http://envisat.esa.int/workshops/mavt_2006/MAVT-2006-0304_C Tinel.pdf)

Note: in the same Workshop, other results of vicarious calibration for MERIS, not based on METRIC extraction, were also presented.
6.2 Instrument Characterization

6.2.1 Instrument degradation

The mean per camera degradation (diffuser ageing corrected) for each camera analysis highlights:

1. Instrument response continues to degrade exponentially (up to approximately 5%), and is both wavelength and camera dependent
2. There is no significant degradation caused by the E2010+ Orbit change (see red vertical line on plots)
6.2.2 Diffuser ageing

Diffuser Ageing is monitored as the evolution with time of Diffuser 1 to Diffuser 2 (D1/D2). It shows a fairly linear trend over time with small variations correlated to yearly cycles. The linear fit is used operationally to correct Diffuser 1.
Please note, due to geometry uncertainties during the E2010+ Orbit change, anomalous spikes can be seen in the diffuser ageing trend (year 7.5 in the first image, and the anomalous red dotted line in the second). This is not believed to indicate a severe ageing anomaly as all post-Orbital change acquisitions follow the pre-Orbital change trend.

6.2.3 Smile Effect

No new results to be shown for Cycle #112. For the most recent updates, refer to Cyclic Report #23 that can be found on the above-mentioned MERIS website.
6.2.4 Spectral evolution from erbium measurements

Analysis of the complete set of spectral calibration data from the Erbium doped diffuser confirms:

1. Stability of the absolute wavelength for cameras 1, 3 and 5; although small possibility Camera 3 has a slight negative shift.

2. Slight increase over time of the wavelength observed by a given CCD row for camera 2 and 4 (about 0.12 nm for camera 2 and 0.20 nm for camera 4). The curve trend seems however to go towards stabilisation.

3. Shifts are wavelength independent

4. Anomalous spikes acquired around Orbit 45000 are likely due to a geometry uncertainty during E2010+ Orbit change manoeuvre. All post-E2010+ data are fully in line with pre-E2010+ trends.

   Figure 6 (below) shows the evolution of the spectral calibration of MERIS around 408 nm and 520 nm with respect to Orbit #650.
Figure 6 – Evolution of the spectral calibration of MERIS around 408 nm (top) and 520 nm (bottom) with respect to Orbit #650
7. DATA QUALITY CONTROL

7.1 MERIS products Quality Status

The current IPF is version 6.04, and it has been operational since 3\textsuperscript{rd} November 2011. The full evolution path can be found on Page 9 of the following document:

\url{http://earth.esa.int/pcs/envisat/meris/documentation/MERIS_IPF_evolution.pdf}

7.2 Anomalies and Software Problem Reporting (SPR)

Blank records have been identified in some MERIS products rejected by visual inspections using the AMALFI system. These black lines crossing the track are a nominal behaviour of the processor, which replaces missing or corrupted Instrument Source Packets (ISPs) with blank data to preserve the geographical consistency of the scene.

8. FIRST 2003 MERIS ARCHIVE REPROCESSING

Information concerning the 1\textsuperscript{st} reprocessing of the 2003 MERIS data archive done spring 2004 can be found on the MERIS website:

\url{http://earth.esa.int/pcs/envisat/meris/documentation/First_2003_MERIS_Reprocessing.pdf}

The document explains also how to access the reprocessed data.

9. SECOND 2005 MERIS ARCHIVE REPROCESSING

Following the recommendations of the Data Quality Working Group and the Science Advisory Group, improvements to MERIS processing resulted in version 7.4 of the off-line processor MEGS. It is currently being used for a complete reprocessing of the MERIS Reduced Resolution data archive. The corresponding time period extends from June 2002 to June 2005. 2003 and 2004 data will be made available through the MERCI (MERIS Catalogue and Inventory) service by the end of year 2005. For further information see:

\url{http://envisat.esa.int/services/catalogues.html}

10. THIRD MERIS REPROCESSING

A number of significant improvements provided by the MERIS QWG have been implemented in the 3\textsuperscript{rd} MERIS Reprocessing dataset; the reprocessing of all Reduced Resolution products has been completed using MEGS 8.0 ACRI-ST and information can be found \url{here} and on the \url{PCS website}. The operational version of the MEGS 8.0, known as the IPF became operational at Ground Stations on 3\textsuperscript{rd} November 2011.
11. MERIS PROCESSOR EVOLUTION

A detailed description of the MERIS IPF evolution since March 2002 until present, in terms of data format changes and algorithm modifications, can be found on the MERIS website:

http://earth.esa.int/pcs/envisat/meris/documentation/MERIS_IPF_evolution.pdf

12. VALIDATION ACTIVITIES AND RESULTS

The presentations given at the MAVT-2006 held at ESA ESRIN, Frascati, Italy, from the 20th to the 24th of March 2006 are now available at the following address:

http://envisat.esa.int/workshops/mavt_2006/

13. HOW TO GET MERIS DATA

Information concerning the different ways to access the MERIS data can be found on the MERIS website:

http://earth.esa.int/pcs/envisat/meris/documentation/Access_to_MERIS_data.pdf

14. GENERAL INFORMATION

1. The European Space Agency organised a joint MERIS and (A)ATSR user workshop, held at ESRIN, Frascati, Italy, on 26th to the 30th of September 2005. All information about the objectives of the workshop as well as the participants’ presentations can be found on ESA’s official page:

http://envisat.esa.int/workshops/meris_aatsr2005/

2. The European Space Agency organised the second working meeting on MERIS and (A)ATSR Calibration and Geophysical Validation (MAVT-2006) in ESRIN, Frascati, Italy, from the 20th to the 24th of March 2006. All information about the objectives of the workshop as well as the participants’ presentations can be found on ESA’s official pages:

http://envisat.esa.int/workshops/mavt_2006/

3. The European Space Agency organised a second joint MERIS and (A)ATSR user workshop, held at ESRIN, Frascati, Italy, from the 22nd to the 26th of September 2008. All information about the objectives of the workshop can be found on ESA’s official page:

http://earth.esa.int/meris_aatsr_2008/