ENVISAT - AATSR

CYCLIC REPORT #67

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<tr>
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<td>21 APR 2008</td>
</tr>
<tr>
<td>ORBIT #</td>
<td>31618</td>
<td>32118</td>
</tr>
</tbody>
</table>

Western Africa, 29 March 2008 - RGB Composite image showing large clouds of sand off the coast of Senegal.

prepared by/préparé par: AATSR DPQC and QWG team
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Document type/type de document: Technical Note
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<tr>
<td>author auteur</td>
<td>Gordon Mack</td>
</tr>
<tr>
<td>approved by approuvé par</td>
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## CHANGE LOG

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## CHANGE RECORD

Issue: 1 Revision: 0

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AATSR CYCLIC REPORT # 67

1 INTRODUCTION

The AATSR Cyclic Report is distributed by the AATSR DPQC team to keep the AATSR community informed of any modification regarding instrument performances, the data production chain and the results of calibration and validation campaigns at the end of each Envisat cycle, which consists of 501 complete orbits over the course of 35 days.

This document is available online at: http://earth.esa.int/pcs/envisat/aatsr/reports/cyclic/

1.1 Acronyms and Abbreviations

AATSR  Advanced Along Track Scanning Radiometer
APC   Antenna Pointing Controller
CR    Cyclic Report
DDS   Data Dissemination System
DMOP  Detailed Mission Operation Plan
DMS   Data Management System
DPQC  Data Product Quality Control
EN-UNA-YYYY/#  Envisat Unavailability (plus year and number)
ESOC  European Space Operation Centre
HSM   High Speed Multiplexer
IECF  Instrument Engineering and Calibration Facilities
IPF   Instrument Processing Facilities
LUT   Look Up Table
MPS   Mission Planning Schedule
NRT   Near Real Time
OCM   Orbit Control Manoeuvre
OBDD  On-board Data Handling
PDS   Payload Data Segment
PMC   Payload Management Computer
RAL   Rutherford Appleton Laboratory
SPR   Software Problem Reporting
SW    Software
VISCAL Visible Calibration

The AATSR list of acronyms and abbreviations is in the following site:
http://envisat.esa.int/dataproducts/aatsr/CNTR5.htm#eph.aatsr.glossary
2 SUMMARY

Cyclic Report: 67

The main activities during the cycle have been as follows:

- **L0 Processor and IPF Version:**
  L0 Processor – no change (5.22)
  Level 1b & Level 2 processor – no change (6.01)

- **Visible channel calibration:**
  The visible calibration data supplied as an aux file (ATS_VC1_AX) continued to be regularly updated throughout the cycle.

- **ESRIN NRT Disruption**
  The dissemination of Near Real Time data from ESRIN was disrupted from the 19th of March until the 25th of March. The backlog of data was recovered by the 26th of March.

- **Svalbard Anomaly**
  Due to an anomaly at the Svalbard station, orbits 31766 and 31776 were not acquired. Additionally, data transfer problems from the 28th to the 30th of March at Svalbard, meant that NRT data from ESRIN was disrupted.

- **Return to ARTEMIS Scenario**
  As anticipated, following the docking of the ATV, ARTEMIS returned to service over the 7th and 8th of April. With this return to service the ‘extra packets’ problem associated with the Svalbard acquisition method was resolved.

- **Data reception problems at ESRIN**
  Due to a severe storm on the night of the 18th of April, data acquisition at ESRIN was disrupted. One orbit acquired and disseminated (orbit 32064) during this period was affected by extreme CRC errors resulting in orbit fragmentation.

- **Missing ATS AUX data**
  No L1 data was available on the 19th and 20th of April due to missing auxiliary data. This problem was resolved and the backlog recovered.
**Auxiliary File Versions**

The list of auxiliary files found at [http://earth.esa.int/services/auxiliary_data/aatsr/](http://earth.esa.int/services/auxiliary_data/aatsr/) was reviewed and corrections were made. Section 3.2 of this report has also been updated to reflect these corrections.
3 SOFTWARE & AUX FILE VERSION CONFIGURATION

3.1 Software Version
AATSR IPF for Level 1 and Level 2: Version 6.01

3.2 Auxiliary Files
AATSR processing uses the following auxiliary files:

- Browse Product Lookup Data (ATS_BRW_AX)
- L1b Characterisation Data (ATS_CH1_AX)
- Cloud Lookup Table Data (ATS_CL1_AX)
- General Calibration Data (ATS_GC1_AX)
- AATSR Instrument Data (ATS_INS_AX)
- Visible Calibration Coefficients Data (ATS_VC1_AX)
- L1b Processing Configuration Data (ATS_PC1_AX)
- L2 Processing Configuration Data (ATS_PC2_AX)
- SST Retrieval Coefficients Data (ATS_SST_AX)
- LST Land Surface Temperature Coefficients Data (ATS_LST_AX)

The latest filename for each auxiliary file in use in the PDS is as follows:

<table>
<thead>
<tr>
<th>Product name</th>
<th>Filename</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATS_BRW_AXVIEC20020123_072338_20020101_000000_20200101_000000</td>
<td></td>
</tr>
<tr>
<td>ATS_CH1_AXVIEC20070720_093530_20020301_000000_20200101_000000</td>
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<td>ATS_CL1_AXNIEC20070223_102348_20010308_120446_20120801_235959</td>
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</tr>
<tr>
<td>ATS_INS_AXVIEC20070720_094014_20020301_000000_20200101_000000</td>
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</tr>
<tr>
<td>ATS_PC1_AXVIEC20070720_094312_20020301_000000_20200101_000000</td>
<td></td>
</tr>
<tr>
<td>ATS_PC2_AXVIEC20020123_074151_20020101_000000_20200101_000000</td>
<td></td>
</tr>
<tr>
<td>ATS_SST_AXVIEC20051205_102103_20020101_000000_20200101_000000</td>
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</tr>
</tbody>
</table>

See below for VC1 files

<table>
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<th>Filename</th>
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<td>ATS_PC2_AXVIEC20020123_074151_20020101_000000_20200101_000000</td>
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<tr>
<td>ATS_SST_AXVIEC20051205_102103_20020101_000000_20200101_000000</td>
<td></td>
</tr>
</tbody>
</table>

Table 3-1 Latest auxiliary files currently in use by the PDS

3.2.1 STATUS OF DAILY VISIBILE CALIBRATION FILES

3.2.1.1 VC1 File Availability
The daily reflectance channel calibration files were available for all dates, except for the following:
• 20 March 2008,
• 26 March 2008,
• 30 March 2008,
• 02 April 2008.

The orbital VC1 files continued to be generated from the available L0 data.

3.2.2 STATUS OF OTHER AUXILIARY FILES

No auxiliary files changed during this cycle.
4 PDS STATUS

4.1 Instrument Unavailability

There were no AATSR unavailabilities during this cycle.

4.2 L0 Data Acquisition and L1b Processing Status

<table>
<thead>
<tr>
<th>Week</th>
<th>Orbit Start</th>
<th>Orbit Stop</th>
<th>Availability (s)</th>
<th>Availability (%)</th>
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<tr>
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<td>Start</td>
<td>Stop</td>
<td>Inst Unav</td>
<td>L0 gaps</td>
</tr>
<tr>
<td>1 March 17, 2008</td>
<td>31618</td>
<td>31717</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2 March 24, 2008</td>
<td>31718</td>
<td>31817</td>
<td>0</td>
<td>12373</td>
</tr>
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<td>3 March 31, 2008</td>
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<td>31917</td>
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<td>6191</td>
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<td>4 April 07, 2008</td>
<td>31918</td>
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<td>5 April 14, 2008</td>
<td>32018</td>
<td>32117</td>
<td>0</td>
<td>14389</td>
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</tbody>
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Table 4-1 Instrument and data unavailability weekly summary for cycle 67

The instrument was available for 100.00% of the time during the cycle.
The L0 data were available for 98.56% of the time during the cycle.
The L1b data were available for 98.37% of the time during the cycle.

The following L0 data was missing from this cycle:

NB Missing L0 data are automatically also missing at L1b. Therefore the missing L1b data specifically reported in Table 4-3 represent additional data gaps where the start time does not coincide with L0 data already known to be missing.
<table>
<thead>
<tr>
<th>UTC Start</th>
<th>UTC Stop</th>
<th>Duration (s)</th>
<th>Orbit Start</th>
<th>Orbit End</th>
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<tbody>
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Table 4-2 ATS_NL__0P missing data during cycle 67

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<th>Duration (s)</th>
<th>Orbit Start</th>
<th>Orbit End</th>
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<td>2293</td>
<td>32066</td>
<td>32066</td>
</tr>
</tbody>
</table>

Table 4-3 ATS_TOA_1P missing data during cycle 67
4.2.1 ORBITS AFFECTED BY POOR DATA QUALITY

The information reported in Section 4.2 does not consider the quality of data, only whether or not it is available.

During this cycle, the following orbits contained frames suffering from bad/missing telemetry:

- 31578, 31579 (15th March 2008)
- 31820 (1st April 2008)
- 31924 (8th April 2008)
- 31925 (8th April 2008)
- 31969 (11th April 2008)
- 31982 (12th April 2008)
- 32025 (15th April 2008)
- 32063 (18th April 2008)

Data from orbits received at Svalbard and processed at ESRIN continued to exhibit extra packets at the end of the product. This was resolved with the transition back to the ARTEMIS scenario on the 7th/8th of April.

4.3 L0 and L1b Backlog Processing Status

There is no update available for report on the status of backlog processing.
5 DATA QUALITY CONTROL

5.1 Monitoring of Instrument Parameters

5.1.1 JITTER

![Jitter trend from mission start](image)

Figure 5.1 Jitter trend from mission start

The plot shows the jitter-trend since the start of the mission, against both orbit-number and cycle-number. The mean jitter-rate (per-orbit) is shown in blue and the maximum rate per orbit in red. The green horizontal line shows the nominal mean jitter-level achieved for much of the mission.

The jitter plot shows an improvement with respect to previous cycles. There is no significant deterioration in image quality associated with these jitter levels, but this is continually monitored.

5.1.2 SENSOR TEMPERATURE

While in measurement mode, all sensors maintained their nominal orbital and seasonal ranges in this cycle.
5.1.3 VISCAL

"Daily" VC1 files were delivered for most days except:
- 26th of March
- 30th of March
- 2nd of April

In addition, the following set of "orbit-by-orbit" VC1 files was delivered:
http://aatsr2.ag.rl.ac.uk/data2/aatsr2/EDS-X/CyclePlots/VC1-67.txt

5.1.4 NEΔT

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Table 5-1 NEΔT data for cycle 66

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</table>

Table 5-2 NEΔT data for cycle 67

5.2 User Rejections

There were no user rejections during this cycle.

5.3 Software Problem Reporting

This section describes the open SPRs, their potential impact on the data quality, and SPRs that have been closed.

5.3.1 EXISTING SPRS THAT ARE STILL OPEN

The following SPRs are still open:

Inconsistent values in AST Confidence word, 17 and 50km cells
NA-PR-07-02946

The AST confidence word may be incorrectly set for records where the nadir or dual view SST retrieval was invalid, indicating that the 3.7 micron channel was used (although this has no meaning in this instance). Although the wrongly set flags may be ignored as far as the 17km cell is concerned, they present a problem since they


may propagate into the confidence word for the 50km cell. The problem does not occur for daytime (descending) arcs where the retrievals are valid for both views.

5.3.2 NEW SPRS SINCE THE LAST CYCLIC REPORT
No SPRs have been opened since the last Cyclic Report.

5.3.3 CLOSED SPRS
No SPRs have been closed since the last Cyclic Report.

5.4 Monthly Level 3 Product
The following plots have been generated from all available Meteo products acquired in April. This consists of 418 orbits from 31820 to 32248. Figures Figure 5.3, Figure 5.4, Figure 5.5, Figure 5.6 show the SST average in dual and nadir views, the number of contributory orbits and the standard deviation.

Please note we are not able to provide absolute colour scales at this time, however the colouring scheme used is given in and the data ranges of each diagram are also given.

Figure 5.2 – This is the colouring scheme used for the following plots, running from left to right with increasing magnitude,
Figure 5.3 - This figure gives the monthly average SST (Dual View), with a data range of 270 - 305 Kelvin

Figure 5.4 - This figure gives the monthly average SST (Nadir View), with a data range of 270 - 305 Kelvin
Figure 5.5 - The standard deviation of the monthly average in SST with a data range of 0 to 2 Kelvin.

Figure 5.6 – The number of contributory orbits to the calculation of the SST, with a data range of 0 to 10.
6 CALIBRATION/VALIDATION ACTIVITIES & RESULTS

6.1 Calibration

No additional calibration results were reported during this cycle.

6.2 Validation

A monthly mean global dual-view SST plot for Cycle 67 composed from ATS_AR__2P 10' data is shown below in Figure 6.1. The monthly mean contains day time and night time data.

![Figure 6.1: Monthly Global Average dual-view SST for Cycle 67.](image)

The Met Office has validated the AATSR dual-view SST data using the global network of in situ buoy SST data, the results for Cycle 67 being shown in Figure 6.2. The updated SST coefficients released in December 2005 were used in the AATSR SST retrievals.
Figure 6.2: Comparison of daily mean difference between 10° AATSR SST values and in situ buoy SST for Cycle 67. Data provided by the Met Office.

During cycle 67, there were 1671 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of -0.014 K, standard deviation 0.25 K, and a mean (dual-view bulk SST minus buoy SST) of +0.131 K, standard deviation 0.23 K. A total of 1629 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.052 K, standard deviation 0.32 K, and a mean (dual-view bulk SST minus buoy SST) of +0.213 K, standard deviation 0.31 K. As these data are comparisons of a single point buoy measurement against a much larger spatially averaged value they are not a true indicator of AATSR’s accuracy and are used to show consistency of data quality between cycles.

Figure 6.3: Plot of daily number of match-ups between 10° AATSR SST values and in situ buoy SST for Cycle 67. Data provided by the Met Office.
Figure 6.4: Map showing global distribution of match-ups between 10° AATSR SST values and in situ buoy SST for Cycle 67. The red dots indicate a match-ups to a moored buoy; the cyan dots indicate a match-up to a drifting buoy. Data provided by the Met Office.

A complete update on the status of the instrument validation can be found in Section 1.6.2 of Cyclic Report 28.
7 DISCLAIMERS

No new disclaimers have been issued during this cycle.