

# **ENVISAT - AATSR**

## **CYCLIC REPORT #46**

	START	END
<i>DATE</i>	<i>13 MARCH 2006</i>	<i>17 APRIL 2006</i>
<i>TIME</i>	<i>21:59:29</i>	<i>21:59:29</i>
<i>ORBIT #</i>	<i>21097</i>	<i>21597</i>

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## AATSR CYCLIC REPORT # 46

### 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
MPS	Mission Planning Schedule
NRT	Near Real Time
OCM	Orbit Control Manoeuvre
OBDAH	On-board Data Handling
PDS	Payload Data Segment
PMC	Payload Management Computer
SPR	Software Problem Reporting
SW	Software
VISCAL	Visible Calibration

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

## 2 SUMMARY

**Cyclic Report:** 46  
**Cycle Start:** 13 March 2006, 21:59:29, Orbit #: 21097  
**Cycle End:** 17 April 2006, 21:59:29 Orbit #: 21597

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 (5.59)
- **Visible channel calibration:**  
The visible calibration data supplied as an aux file (ATS\_VC1\_AX) continued to be regularly updated throughout the cycle.
- **OCM:**  
There was a period of planned unavailability during this cycle, which was an orbit out-of-plane manoeuvre on 28 March 2006 from 00:44:57 to 12:59:58.
- **Envisat Service Module anomaly:**  
There was a period of unplanned unavailability during this cycle which was due to a Service Module anomaly on 06 April 2006 at 02:09:26; AATSR was successfully recovered on 8 April 2006 at 18:38:12.
- **Artemis:**  
There were two periods of unplanned unavailability for Artemis due to anomalies relating to the Antenna Pointing Controller (APC). These occurred on 12 April 2006 from 20:48:14 to 21:05:37 and from 22:27:10 to 22:35:44.

### 3 SOFTWARE & AUX FILE VERSION CONFIGURATION

#### 3.1 Software Version

AATSR IPF for Level 1 and Level 2: Version 5.59

#### 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:

Product name
ATS_BRW_AXVIEC20020123_072338_20020101_000000_20200101_000000
ATS_CH1_AXVIEC20021114_113144_20020301_000000_20070801_235959
ATS_CL1_AXVIEC20020123_073044_20020101_000000_20200101_000000
ATS_GC1_AXVIEC20020123_073430_20020101_000000_20200101_000000
ATS_INS_AXVIEC20030731_092706_20020301_000000_20070801_235959
See below for VC1 files
ATS_LST_AXVIEC20040311_095537_20020301_000001_20070801_235959
ATS_PC1_AXVIEC20040812_063722_20020301_000000_20070801_235959
ATS_PC2_AXVIEC20020123_074151_20020101_000000_20200101_000000
ATS_SST_AXVIEC20051205_102103_20020101_000000_20200101_000000

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

### 3.2.1 STATUS OF DAILY VISIBLE CALIBRATION FILES

#### 3.2.1.1 VC1 File Availability

Reflectance channel calibration files were available for all dates, except:

- 18<sup>th</sup> March 2006
- 4<sup>th</sup> April 2006
- 5<sup>th</sup> April 2006

Additionally, none were generated on the date when the OCM was taking place:

- 28<sup>th</sup> March 2006

Nor were any generated for the following dates due to the Envisat Service Module anomaly:

- 6<sup>th</sup> April 2006
- 7<sup>th</sup> April 2006
- 8<sup>th</sup> April 2006\*
- 9<sup>th</sup> April 2006\*

\*No Level 0 files on the DDS

### 3.2.2 STATUS OF OTHER AUXILIARY FILES

The following list highlights any of the other auxiliary files changed during this cycle.

Product name	Date Introduced	Validity Range	Reason for Change
No changes during this cycle			

## 4 PDS STATUS

### 4.1 Instrument Unavailability

AATSR data were unavailable due to instrument unavailability at the following times during the cycle:

UTC Start	UTC Stop	Reason	Reference	Planned
28 <sup>th</sup> March 2006 00:44:57	28 <sup>th</sup> March 2006 12:59:58	OCM	EN-UNA-2006/0104	Yes
06 <sup>th</sup> April 2006 02:09:26	08 <sup>th</sup> April 2006 18:38:12	Envisat Service Module anomaly	EN-UNA-2006/0116	No
12 <sup>th</sup> April 2006 20:48:14	12 <sup>th</sup> April 2006 21:05:37	Artemis unavailability	ART-ENV-UNA-2006/013	No
12 <sup>th</sup> April 2006 22:27:10	12 <sup>th</sup> April 2006 22:35:44	Artemis unavailability	ART-ENV-UNA-2006/013	No

Table 4-1 Instrument unavailability during cycle 46

### 4.2 L0 Data Acquisition and L1b Processing Status

The L0 data were available for 99.57% of the time during the cycle.

The L1b data were available for 98.07% of the time during the cycle.

The following L0 and L1b data were 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.

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
14-Mar-2006 22:55	15-Mar-2006 00:35	5996	21111	21112
27-Mar-2006 05:33	27-Mar-2006 06:08	2072	21287	21287
06-Apr-2006 00:45	06-Apr-2006 02:09	4987	21427	21428

Table 4-2 ATS\_NL\_\_0P missing data during cycle 46

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
28-Mar-2006 00:34	28-Mar-2006 00:44	637	21298	21299
28-Mar-2006 21:09	28-Mar-2006 22:09	3582	21311	21311
29-Mar-2006 20:38	29-Mar-2006 21:38	3567	21325	21325
30-Mar-2006 21:11	31-Mar-2006 02:11	17976	21339	21342
31-Mar-2006 05:49	31-Mar-2006 06:41	3110	21345	21345
01-Apr-2006 20:44	01-Apr-2006 21:50	3963	21368	21368
02-Apr-2006 20:10	02-Apr-2006 21:12	3696	21382	21382
04-Apr-2006 20:50	04-Apr-2006 21:55	3940	21411	21411
09-Apr-2006 22:36	10-Apr-2006 00:15	5932	21483	21484



UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
10-Apr-2006 03:10	10-Apr-2006 04:52	6090	21486	21486
13-Apr-2006 11:08	13-Apr-2006 12:48	6003	21534	21534

**Table 4-3 ATS\_TOA\_1P missing data during cycle 46**

#### 4.2.1 ORBITS AFFECTED BY POOR DATA QUALITY

The information reported in Table 4-2 & Table 4-3 does not consider the quality of data, only whether or not it is available.

In the following orbits, a few frames suffered from bad/missing telemetry:

- 21106 (14<sup>th</sup> March 2006)
- 21108 (14<sup>th</sup> March 2006)
- 21354 (31<sup>st</sup> March 2006)
- 21536 (13<sup>th</sup> April 2006)
- 21594 (17<sup>th</sup> April 2006)

### 4.3 L0 and L1b Backlog Processing Status

The following data, reported missing from previous cycles, have been retrieved via backlog processing:

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
11-Mar-2006 21:09	11-Mar-2006 22:45	5788	21067	21068
12-Mar-2006 22:24	12-Mar-2006 23:54	5432	21082	21083
13-Mar-2006 01:44	13-Mar-2006 02:45	3677	21084	21085

**Table 4-4 Backlog processing status during cycle 46**

## 5 DATA QUALITY CONTROL

### 5.1 *Monitoring of Instrument Parameters*

#### 5.1.1 JITTER

On April 06 the Envisat platform suffered an anomaly which switched AATSR off until April 08. Prior this anomaly, the average scan-mirror jitter rate was 0.03 jitters/sec or better.

After this anomaly, the scan-mirror jitter entered a particularly bad period peaking between April 10 and April 12 when jitter rates reached as high as 0.8 jitters/sec.

Throughout the week April 10-16, jitter rates were much higher than usual.

Users should check the jitter rate during the period covered by their products by checking the Scan Quality Annotation Data Sets (using EnviView, for example).

#### 5.1.2 SENSOR TEMPERATURE

All sensors maintained their nominal orbital and seasonal ranges in this cycle except for the days during and immediately following the following the platform anomaly. During this period, reflectance channel temperatures were colder than nominal - and thermal channel temperatures were warmer, until the cool-down was reached.

#### 5.1.3 VISCAL

Reflectance channel calibration files are available for most days except:

- March 28
- April 06-09 (Anomaly related)

Nominal viscal characteristics were observed up to the anomaly. After the anomaly, the usual reflectance channel recovery period started (as for planned out-gassings).

## 5.1.4 NE $\Delta$ T

	Hot BB T = 300.04K		Cold BB T = 260.88 K	
	Count	NE $\Delta$ T (mK)	Count	NE $\Delta$ T (mK)
12 $\mu$ m	1.53	32.2	1.16	34.1
11 $\mu$ m	1.57	32.0	1.13	34.4
3.7 $\mu$ m	2.46	31.0	1.18	75.2

Table 5-1 NE $\Delta$ T data for Cycle 46

## 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

#### **Unphysical sea surface temperature values in Level 2 AATSR products from PDHS-E at intervals of 480 rows:**

Open – The investigation shows that the problem does not happen using the IPF 5.59 with respect to the IPF 5.52 on which the problem was detected. Further information on the changes introduced in V5.59 has been requested.

#### **50 / 17 km Cell Size Anomaly in AST product:**

Open – The reason for this effect is understood, but it is proposed that the cell size should stay as-is until further consultation with AATSR users has taken place.

#### **Inconsistent values in AST confidence word, 17 km cell:**

Investigation completed - to be corrected with a patch at the next appropriate opportunity.

### 5.3.2 NEW SPRS SINCE THE LAST CYCLIC REPORT

There are no new SPRs since the last Cyclic Report.

### 5.3.3 CLOSED SPRS

No SPRs have been closed since the last Cyclic Report.

## 6 CALIBRATION/VALIDATION ACTIVITIES & RESULTS

### 6.1 Calibration

No additional calibration results were reported during this cycle.

### 6.2 Validation

A monthly mean global SST plot for Cycle 46 composed from ATS\_AR\_\_2P 10' data is shown below in Figure 6-1.

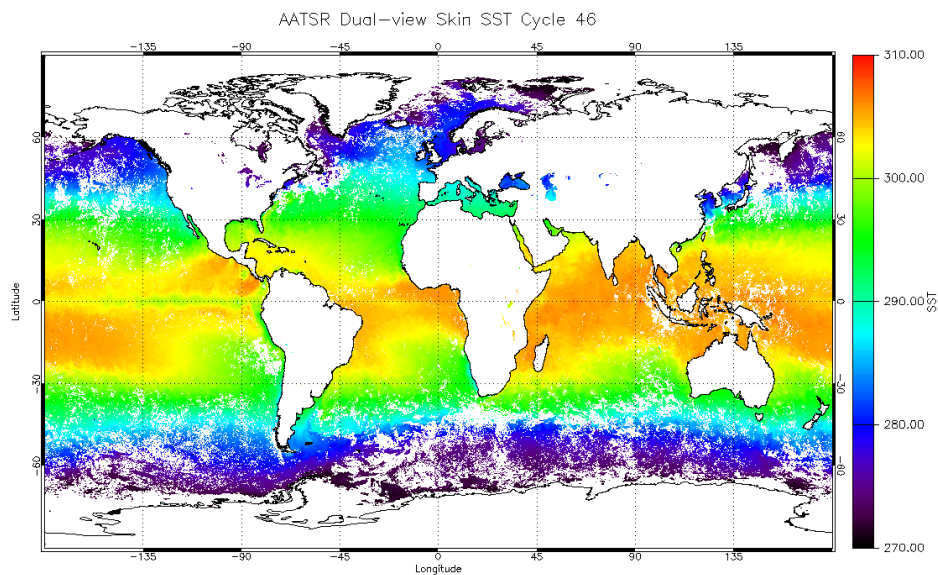


Figure 6-1: Monthly Global Average SST for Cycle 42.

The Met Office has performed a comparison between AATSR dual view SST data and data collected from a network of in situ buoy SST values, the results for Cycle 45 being shown in Figure 6-2. The updated SST coefficients were used in the retrievals.

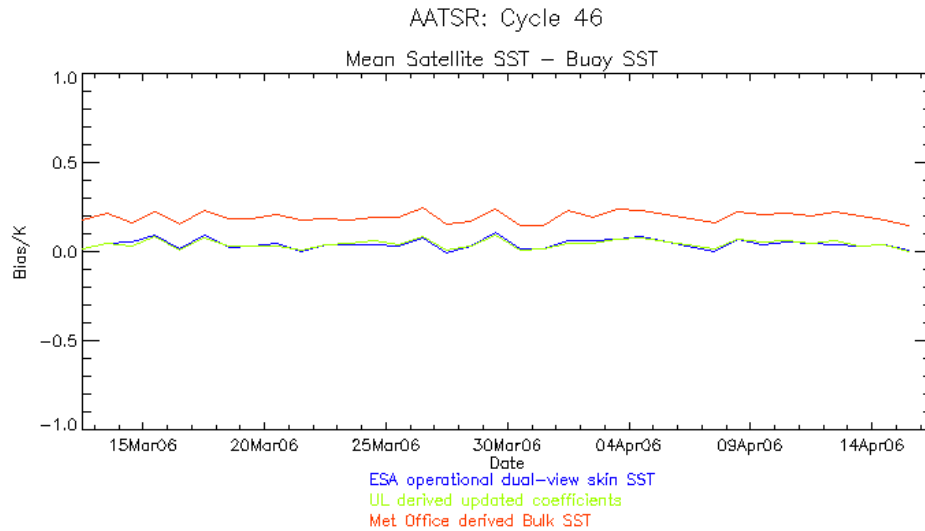
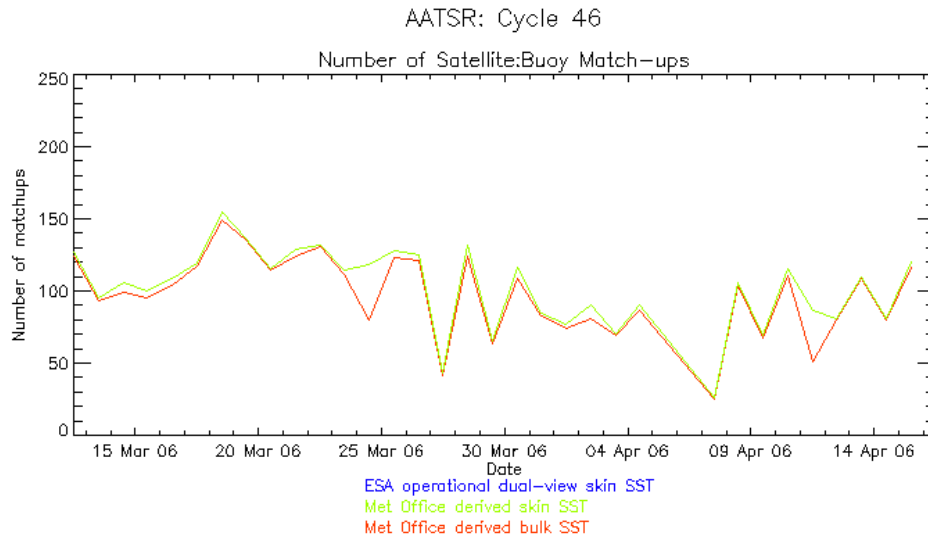
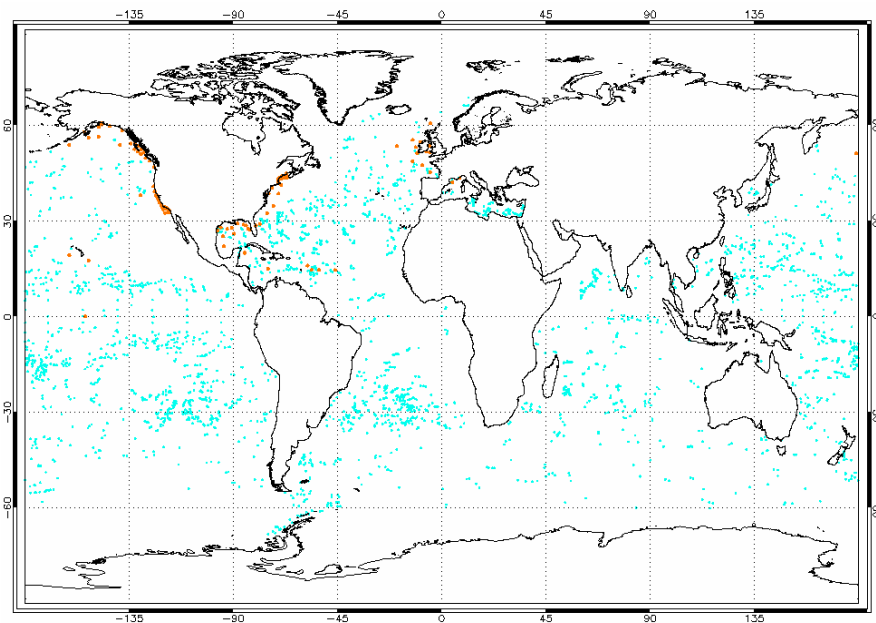


Figure 6-2: Comparison of daily mean difference between 10' AATSR SST values and in situ buoy SST for Cycle 46. Data provided by the Met Office.

During cycle 46, there were 1550 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.015 K, standard deviation 0.27 K, and a mean (dual-view bulk SST minus buoy SST) of +0.163 K, standard deviation 0.25 K. A total of 1594 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.068 K, standard deviation 0.31 K, and a mean (dual-view bulk SST minus buoy SST) of 0.223 K, standard deviation 0.30 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 46. 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 46. The red dots indicate 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.