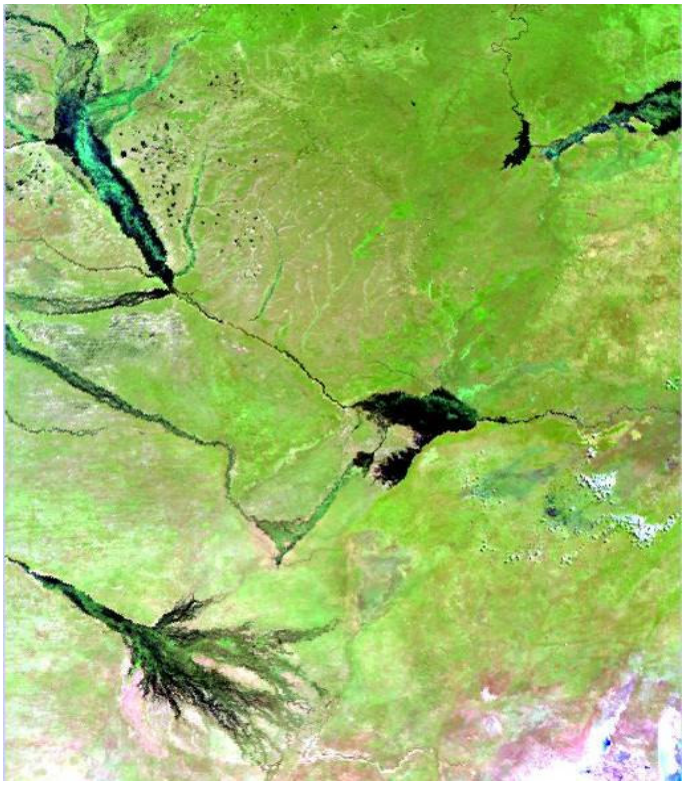
ENVISAT - AATSR

CYCLIC REPORT #78

	START	END
DATE	06 APRIL 2009	11 MAY 2009
TIME	21:59:29	21:59:29
ORBIT #	37129	37629



An RGB combination of 0.87, 0.67 and 0.55 micron channels showing (top left) the Barotse floodplain which is the main feature of the upper Zambezi river, flooding annually during the rainy season, and (top right) annual flooding along the Kafue River. The image is of central southern Africa, spanning Angola, Zambia, Namibia, Botswana and Zimbabwe.

prepared by/*préparé par* AATSR IDEAS and QWG team
reference/*réference*
issue/*édition* 1
revision/*révision* 0

date of issue/*date d'édition* 22 May 2009
status/*état*
Document type/*type de document* Technical Note
Distribution/*distribution*

A P P R O V A L

Title *titre*	AATSR Cyclic Report – Cycle 78	issue *issue* 1	revision *revision* 0
author *auteur*	Rubinder Mannan	date *date*	22 May 2009
approved by *approuvé par*		date *date*	

C H A N G E L O G

reason for change /*raison du changement*	issue/*issue*	revision/*revision*	date/*date*
		0	

C H A N G E R E C O R D

ISSUE: 1 REVISION: 0

reason for change/*raison du changement*	page(s)/*page(s)*	paragraph(s)/ *paragraph(s)*

TABLE OF CONTENTS

AATSR CYCLIC REPORT # 78

1 INTRODUCTION

The AATSR Cyclic Report is distributed by the AATSR IDEAS 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
EN-UNA-YYYY/#	Envisat Unavailability (plus year and number)
ESOC	European Space Operation Centre
HSM	High Speed Multiplexer
IDEAS	Instrument Data quality Evaluation and Analysis Service
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
OBDH	On-board Data Handling
PDS	Payload Data Segment
PMC	Payload Management Computer
RAL	Rutherford Appleton Laboratory
SPR	Software Problem Reporting
SSR	Solid State Recorder
SW	Software
VISCAL	Visible Calibration

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

2 SUMMARY

Cyclic Report: 78

Cycle Start: 06 April 2009, 21:59:29 Orbit #: 37129

Cycle End: 11 May 2009, 21:59:29 Orbit #: 37629

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)

- **AATSR Black-Body Cross-over Test**
  The Envisat AATSR blackbody crossover test took place from 21-Apr-2009 07:53:19 to 23-Apr-2009 08:31:00 UTC. Scientific data for this period is available but will not be optimally calibrated as a result of the test.

  This blackbody crossover test was performed to estimate the relative accuracy of the on-board blackbody target. This was a repeat of the test carried out during the commissioning phase in April 2002 and is repeated on roughly a yearly basis.

  The results from this test indicate that, relative to each other, the brightness temperature errors from the blackbodies are less than 10mK at 11µm and 12µm, and below 20mK at 3.7µm. Comparing with earlier measurements, it was seen that the 11µm and 12µm channels are stable over time, while there appears to be a slow increase at 3.7µm of approximately 6mK over 7 years. Even with this trend, the error is still much smaller than the radiometric noise and does not have a significant effect on the overall radiometric error.

- **Envisat NRT dissemination delays at PDHS-K (Kiruna):**
  Due to required interventions at the PDHS-K (KIRUNA) facilities, there was an interruption to the Envisat Near Real Time (NRT) production / dissemination services on Wednesday 29 April 2009 between 09:00 and 14:00 UTC. Envisat acquisitions and L0 data productions were not impacted during the intervention.

- **Envisat HSM Anomaly**
  An onboard anomaly affected the Envisat payload starting from 28 April 2009 at 13:03 UTC. The recovery procedure required a reset of the High Speed Multiplexer, and as a consequence the interruption of all the Envisat satellite data transmission. Nominal operations were successfully resumed 29 April 2009 at 10:24. AATSR products received after the anomaly were inspected and showed no signs of degradation in quality.

- **Envisat Orbit Control Manoeuvre:**
  An Envisat Orbit Control Manoeuvre (OCM) was executed on 6-7April 2009 and the following instrument unavailability period for AATSR has been registered: 6-Apr 2009 23:44:56 to 7-Apr 2009 06:49:56 UTC.

- **L2P NRT Production Interruption**
  Due to system problems at UK-MM-PAF, transfer of the L2P NRT products to the processing system was interrupted and no L2P products were available on the ftp site from 7-9 May 2009. Once the issue was resolved, all backlogs were recovered.

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:

Product name
ATS_BRW_AXVIEC20020123_072338_20020101_000000_20200101_000000
ATS_CH1_AXVIEC20070720_093530_20020301_000000_20200101_000000
ATS_CL1_AXNIEC20070223_102348_20010308_120446_20120801_235959
ATS_GC1_AXVIEC20070720_093834_20020301_000000_20200101_000000
ATS_INS_AXVIEC20070720_094014_20020301_000000_20200101_000000
See below for VC1 files
ATS_LST_AXVIEC20070720_094144_20020301_000001_20200101_000000
ATS_PC1_AXVIEC20070720_094312_20020301_000000_20200101_000000
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 VISIBILE CALIBRATION FILES

3.2.1.1 VC1 File Availability

The daily reflectance channel calibration files were available for all dates during the reporting period for this cycle.

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

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

UTC Start	UTC Stop	Reason	Reference	Planned
06/04/09 23:44:56	07/04/09 06:49:56	OCM	EN-UNA-2009/0060	Yes
29/04/09 10:17:37	29/04/09 10:26:27	HSM Reset	EN-UNA-2009/0078	No

Table 4-1 Instrument unavailability during cycle 78

4.2 L0 Data Acquisition and L1b Processing Status

Week		Orbit		Availability (s)			Availability (%)		
#	Dates	Start	Stop	Inst Unav	L0 gaps	L1 gaps	Instrument	L0	L1
1	April 9, 2009	37129	37228	25500	0	0	95.78%	95.78%	95.78%
2	April 16, 2009	37229	37328	0	0	0	100.00%	100.00%	100.00%
3	April 23, 2009	37329	37429	530	87975	0	99.91%	85.37%	85.37%
4	April 30, 2009	37430	37529	0	0	0	100.00%	100.00%	100.00%
5	May 7, 2009	37530	37629	0	0	0	100.00%	100.00%	100.00%

Table 4-2 Instrument and data unavailability weekly summary for cycle 78

The instrument was available for 99.14% of the time during the cycle.
The L0 data were available for 96.23% of the time during the cycle.
The L1b data were available for 96.23% of the time during the cycle.

The following L0 data was missing from this cycle:

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
28-Apr-2009 13:03:53	29-Apr-2009 10:17:37	76424	37438	37451
29-Apr-2009 10:26:27	29-Apr-2009 13:38:58	11551	37451	37453
04-May-2009 11:05:30	04-May-2009 12:42:10	5933	37523	37524

Table 4-3 ATS_NL__0P missing data during cycle 78

No L1 data was missing from this cycle that was not associated with the missing L0 data reported above.

A blackbody crossover test took place from 21 to 23 April 2009. Scientific data for this period is available but will not be optimally calibrated as a result of the test.

4.2.1 ORBITS AFFECTED BY POOR DATA QUALITY

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

- 37137 (7th April 2009)
- 37178 (10th April 2009)
- 37195-96 (12th April 2009)
- 37251 (15th April 2009)
- 37336-37337 (21st April 2009)
- 37352 (22nd April 2009)
- 37412 (26th April 2009)
- 37470 (30th April 2009)
- 37480 (1st May 2009)
- 37493 (2nd May 2009)
- 37554-5 (6th May 2009)
- 37566 (7th May 2009)
- 37582, 37584 (8th May 2009)

4.3 L0 and L1b Backlog Processing Status

There is no update available on the status of backlog processing.

5 DATA QUALITY CONTROL

5.1 Monitoring of Instrument Parameters

5.1.1 JITTER

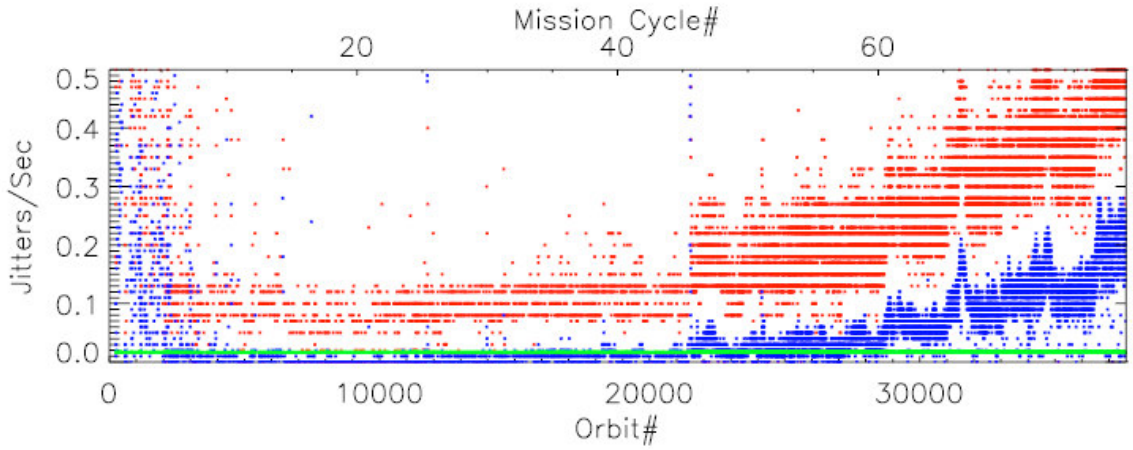


Figure 5.1 Jitter trend from mission start

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 plot shows no significant mean-rate change wrt the previous cycle and remains high.

5.1.2 SENSOR TEMPERATURE

The detector temperature plots for cycle 78 can be found at:

http://aatsr2.ag.rl.ac.uk/data2/aatsr2/EDS-X/CyclePlots/DetTemps78.pdf

While in measurement mode, all sensors maintained their nominal orbital and seasonal ranges in this cycle. The detector temperatures have remained nominal.

5.1.3 VISCAL

NRT calibration quality for AATSR reflectance channels has been maintained throughout this cycle.

In addition, the following set of “orbital” VC1 files was delivered:
http://aatsr2.ag.rl.ac.uk/data2/aatsr2/EDS-X/CyclePlots/VC1-78.txt

5.1.4 NE∆T

	Hot BB T = 302.13K		Cold BB T = 263.29K	
	Count	**NEDT (mK)**	**Count**	**NEDT (mK)**
12µm	1.47	30.6	1.15	33.2
11µm	1.42	28.8	1.09	32.3
3.7µm	2.46	30.8	1.21	74.3

Table 5-1 NE∆T data for cycle 78

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.

AATSR Consolidated Products
NA-PR-08-03952
The AATSR Flight Operations and Data Plan (FODP), PO-PL-ESA-AT-0152, Issue 2 Revision 5 dated 22 November 2001 defines the meaning of “consolidated” in Appendix B.1 as follows: “… time-ordered, no overlap nor data gap except when the instrument is not operated …”, and for Level 0 there should be sufficient overlap only so that the higher level products can be chopped “… ANX to ANX …”. The FODP is part of the high level agreement between ESA and Defra and so can be taken as the definitive requirement for AATSR products.

Update to AATSR Child product generation requirements
NA-PR-08-04015
The 'Child Product Generation Requirements' on pages 520-521 of the document 'PDS Technical Specification for Maintenance and Evolution' (PO-RF-CSF-GS-20437) currently reads:

"For time extraction, for each data set in the parent product, the time stamp of the DSRs shall be compared to that of the requested start time (t0) segment. The first DSR extracted from each data set to form the new child data set is the one with a time stamp immediately preceding or equal to t0. The last DSR extracted from each DS is the one immediately preceding t1."
To ensure that a sufficient number of Auxiliary Data Set Records are present in AATSR child products, the requirement should be changed to read as follows:
"For time extraction, for each data set in the parent product, the time stamp of the DSRs shall be compared to that of the requested start time(t0) segment. The first DSR extracted from each data set to form the new child data set is the one with a time stamp immediately preceding or equal to t0. The last DSR extracted from each DS is the one immediately preceding t1.
For AATSR data, the last ADS DSR extracted from each DS is the one whose time label is equal to or greater than t1 provided such a DSR exists, otherwise the last ADS DSR in the product."

5.3.2 NEW SPRS SINCE THE LAST CYCLIC REPORT

The following new SPR has been opened since the last cyclic report:

Missing AATSR Coverage – March 2007
NA-PR-09-04382
Systematic gaps are present in the consolidated L0 data in the AATSR archive between the 27th of February 2007 and the 28th of March 2007. Typically 2 orbits of data are missing each day, for example on the 6th of March where orbits 26211 and 26219 are missing. On this day orbits 26208-26210 were acquired at Esrin, orbits 26212-26218 were acquired at Kiruna, then orbits 26220+ were acquired at Esrin again.
This behaviour - 2 orbits missing at the switch between acquisition sites - was not observed in NRT. The data should therefore be available and an investigation into the cause of these gaps has been initiated.

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 the available Meteo products acquired in April 2009. This consists of 454 products taken from orbits 37044 to 37472. Figure 5.3, Figure 5.4, Figure 5.5 and Figure 5.6 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for April 2009. Please note we are not able to provide absolute colour scales at this time, however the colouring scheme used is given in Figure 5.2 and the data ranges of each diagram are also given.

Figure 5.2 – This is the colour scheme used for the following plots, running linearly from left to right with increasing magnitude.

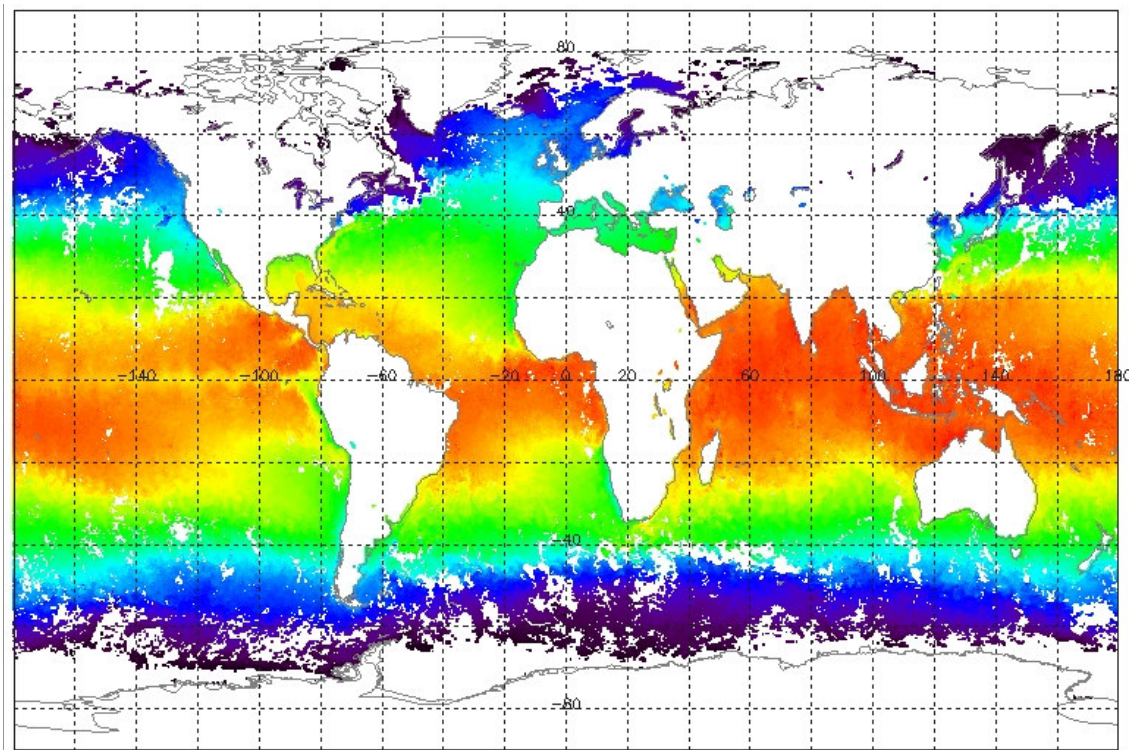


Figure 5.3 - This figure gives the monthly average Dual View SST, with a range of 270 - 305 Kelvin for April 2009.

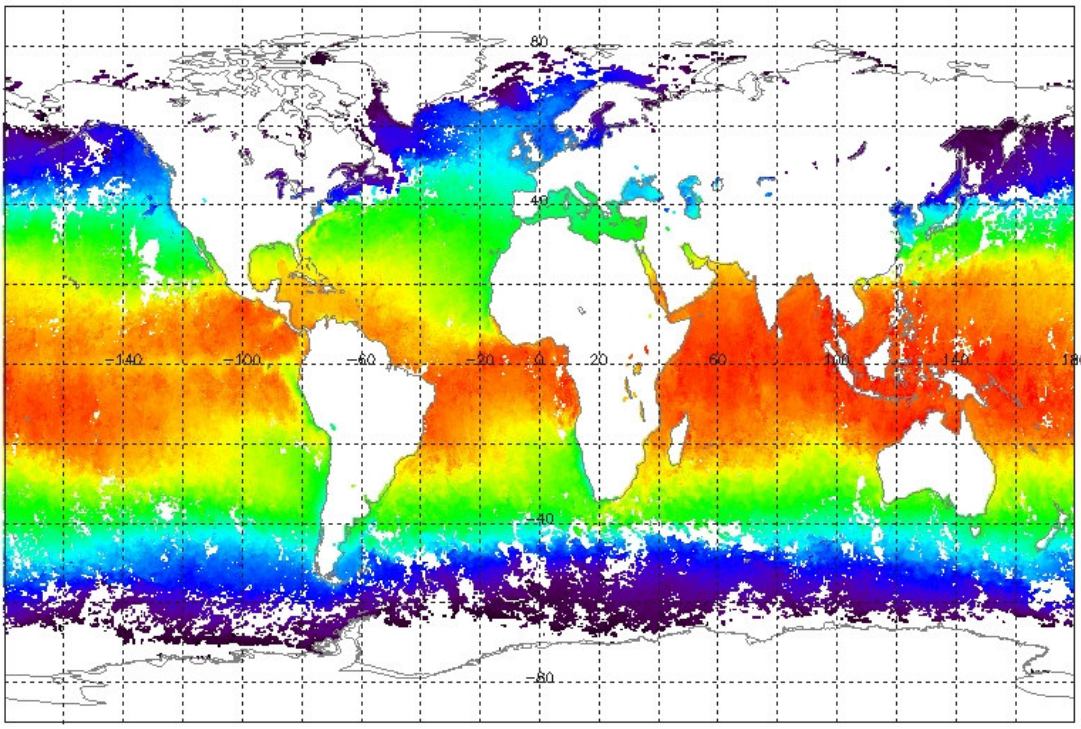


Figure 5.4 - This figure gives the monthly average Nadir SST, with a data range of 270 - 305 Kelvin for April 2009.

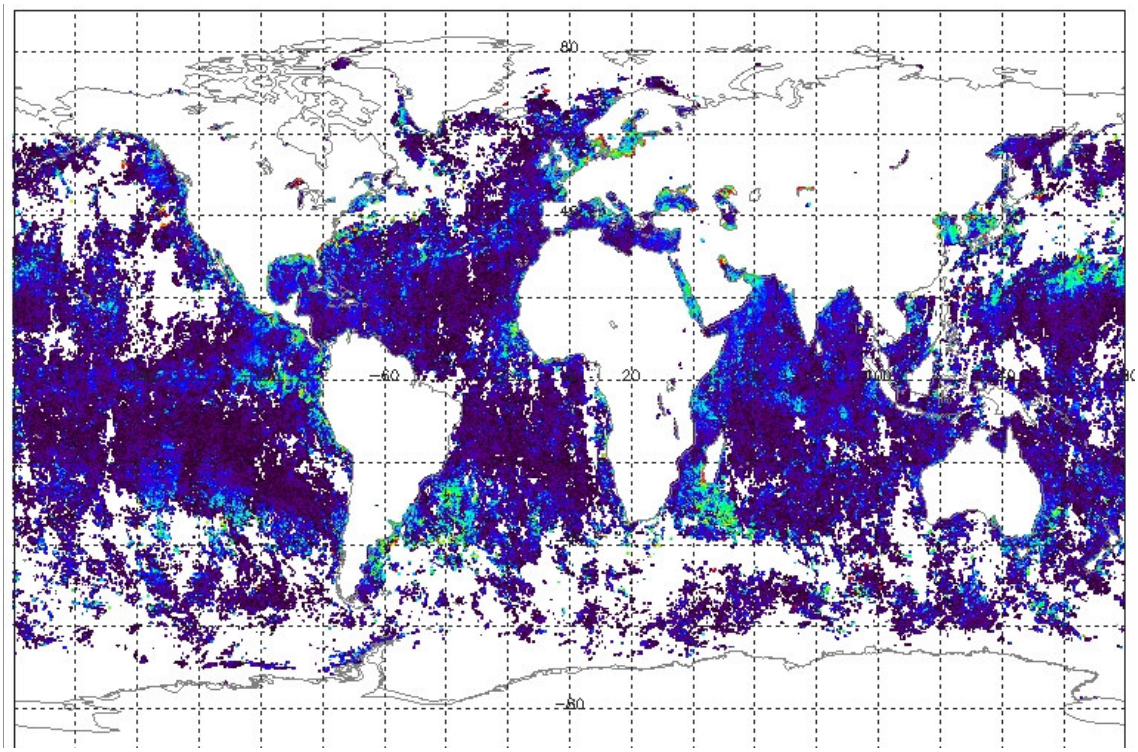


Figure 5.5 - The standard deviation of the monthly average in SST with a data range of 0 to 2 Kelvin for April 2009.

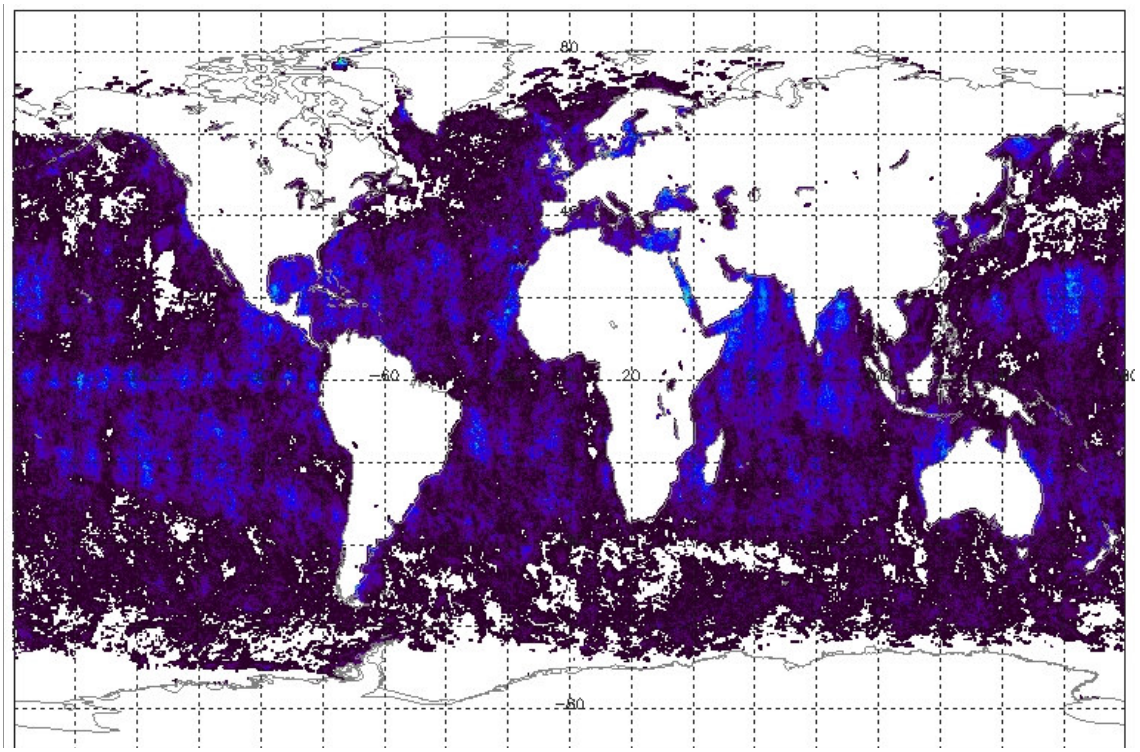


Figure 5.6 – The number of contributory orbits to the calculation of the SST, with a range of 0 to 24 for April 2009.

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 78 composed from ATS_AR__2P 10' data is shown below in Figure 6.1. The monthly mean contains day time and night time data.

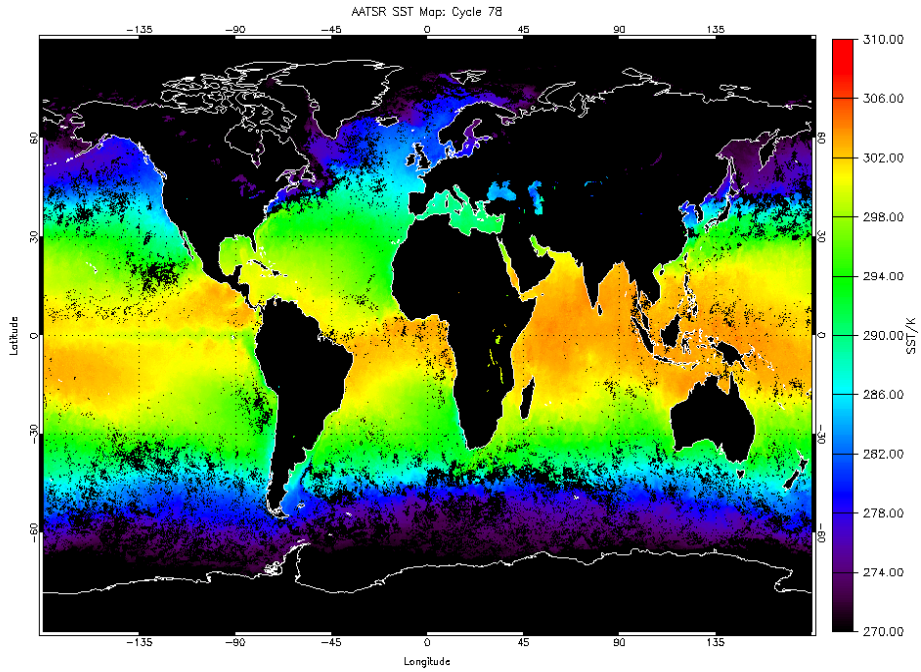


Figure 6.1: Monthly Global Average dual-view SST for Cycle 78

The Met Office has validated the AATSR dual-view SST data using the global network of *in situ* drifting buoy SST data, the results for Cycle 78 being shown in Figure 6.2. The updated SST coefficients released in December 2005 were used in the AATSR SST retrievals.

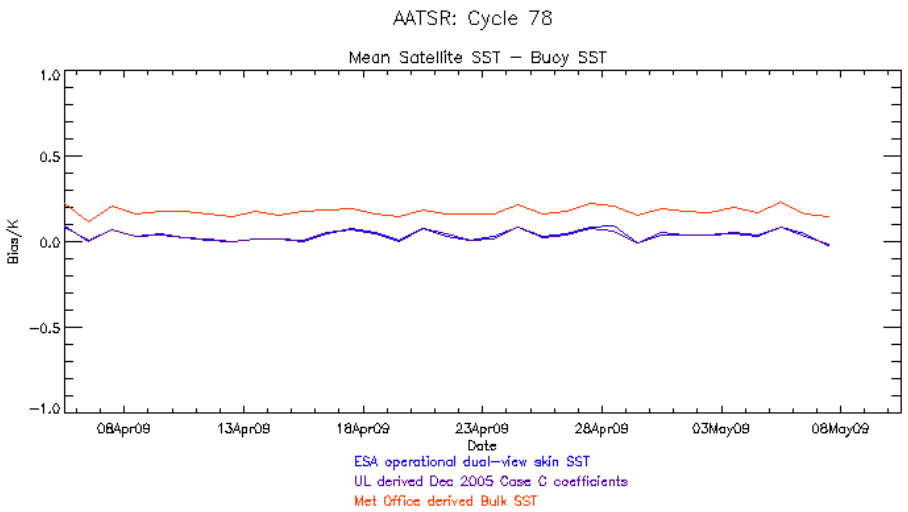


Figure 6.2: Comparison of daily mean difference between 10´ AATSR SST values and in situ buoy SST for Cycle 78. Data provided by the Met Office.

During cycle 78, there were 1561 night time match-ups, with a mean (UL derived dual-view skin SST minus buoy SST) of -0.011 K, standard deviation 0.25 K, and a mean (dual-view bulk SST minus buoy SST) of +0.126 K, standard deviation 0.23 K. A total of 1512 daytime match-ups were found, with a mean (UL derived dual-view skin SST minus buoy SST) of +0.090 K, standard deviation 0.30 K, and a mean (dual-view bulk SST minus buoy SST) of +0.234 K, standard deviation 0.29 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.

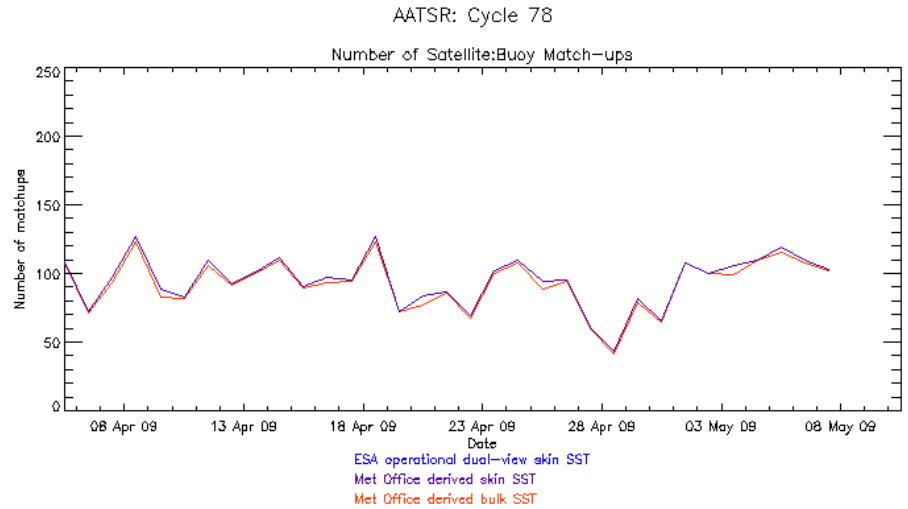


Figure 6.3: Plot of daily number of match-ups between 10´ AATSR SST values and in situ buoy SST for Cycle 78. Data provided by the Met Office.

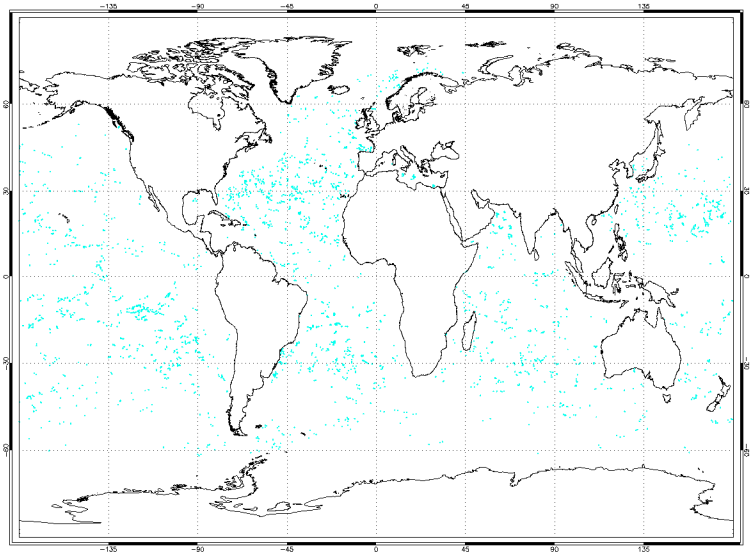


Figure 6.4: Map showing global distribution of match-ups between 10´ AATSR SST values and in situ buoy SST for Cycle 78. The red dots indicate a match-ups to a moored buoy; the cyan dots indicate a match-up to a drifting buoy. Data provided by the Met Office.

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.