ENVISAT - AATSR

CYCLIC REPORT #108

	START	END
DATE	22ND OCTOBER 2011	21ST NOVEMBER 2011
TIME	22:04:04	22:04:14
ORBIT #	50446	50877

This subset from a Level 1B product acquired on 18 November 2011 shows the varying landscape of West Africa, near the Dakar Peninsula. This RGB image is composed of data from the 1.6, 0.87 and 0.55 micron channels in the nadir view.

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AATSR CYCLIC REPORT # 108

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 2010+ cycle, which consists of 431 complete orbits over the course of 30 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
GOSTA	Global Ocean Surface Temperature Atlas
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: 108

Cycle Start: 22nd October 2011, 22:04:04   Orbit #: 50446

Cycle End: 21st November 2011, 22:04:14   Orbit #: 50877

The main activities during the cycle have been as follows:

- **ESRIN downtimes and delays**

  - 08 November 2011: Urgent maintenance affecting communications

  - 17 November 2011: NRT dissemination delay

  - 21 November 2011: Network maintenance affecting communications

- **Kiruna downtimes and delays**

  - 31 October 2011: Network maintenance affecting NRT services

  - 02 November 2011: System problems affecting NRT processing

  - 15, 16 November 2011: Maintenance activity causing possible NRT disruption

- **Reprocessing of AATSR Consolidated Products (orbits 49102-49218)**
  These consolidated products (orbits 49102–49218, 21–29 July 2011) were originally processed with shorter than expected length. They have now been reprocessed with nominal length and are now available from the AATSR archive, replacing the previously generated Level 1 and Level 2 products.

- **AATSR Long Term Drift Correction Developments**
  An email was sent to AATSR users on 01 November 2011 concerning developments in the long-term drift correction table for the AATSR solar reflectance channels; see below for the contents. In order to be placed on this list of AATSR users, please notify Dr D. Smith (Dave.Smith@stfc.ac.uk).

  - Introduction of uncertainty estimates in trend values – these are now included as an additional column for each band. The uncertainty values are primarily based on a statistical analysis of the drift measurements with the underlying assumption that the reference sites used are invariant over long timescales.

  - Introduction of ENVISAT style naming, MPH and SPH. This is to allow the long term drift corrections to be included in the next reprocessing of the AATSR L1b data. The intention for the updated IPF will be the inclusion of a new DSD that directly references the drift correction table filename. A simple file without the additional MPH and SPH will still be available to users.

  - Inclusion of Greenland and Dome-C measurements in drift analysis.

  - Revised adjustment for the seasonal vignetting of the VISCAL diffuser. Prior to summer 2011 we have used the as measured photodiode signal to

provide an additional adjustment to the measured drift to account for a small (<0.5%) vignetting of the solar diffuser at certain times of the year. In order to make the processing of the drift correction table more efficient and reliable, a seasonally averaged adjustment is used. This modification also removes some shorter term effects where there were gaps in the monitor trend, and where the monitor signal is not consistent with the actual signal channel variations, in particular during May 2011 (see AATSR Cyclic Report 105). This modification does have a small impact in the reported drift values, particularly for the early part of the mission where values are shifted slightly by ~1%.

- There is also an updated IDL function AATSR_READ_DRIFT_TABLE.PRO that can read all versions of the table. The calling sequence is the same so there should be no need to modify any code that calls this function. However, the returned structure now includes the uncertainty estimates.

The updated drift correction tables and tools can be found on the AATSR engineering data system at: http://www.aatsrops.rl.ac.uk/EDSX/OtherInfo/.

Note that the drift correction table as provided is the current best estimate of the long-term drift based on a statistical analysis of TOA reflectance measurements over stable desert and ice targets and is therefore based on assumptions about the long term stability of the sites, BRDF etc. Also note that the drift correction does not correct for absolute radiometric biases which are treated separately. Users therefore need to take these and other factors into account when using the tables.

3 SOFTWARE & AUX FILE VERSION CONFIGURATION

3.1 Software Version

AATSR IPF for Level 1 and Level 2:   Version 6.03

AATSR L2P Processor: Version 1.5.

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)

Because the PC1 file contains the orbit period, two versions now need to be maintained after the mission extension orbit manoeuvres.

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_AXVIEC20101015_104659_20020301_000000_20200101_000000
ATS_GC1_AXVIEC20070720_093834_20020301_000000_20200101_000000
ATS_INS_AXVIEC20070720_094014_20020301_000000_20200101_000000
See below for VC1 files
ATS_LST_AXVIEC20101018_094830_20020301_000001_20200101_000000
ATS_PC1_AXVIEC20101015_101827_20020301_000000_20101021_235959
ATS_PC1_AXVIEC20101015_100604_20101022_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 VISIBLE CALIBRATION FILES

3.2.1.1 *VC1 File Availability*

All daily reflectance channel calibration files were available during this cycle.

Ongoing issues with the IECF appear to have been resolved during this cycle, and all orbital files have been disseminated since 04 November 2011.

3.2.2   STATUS OF OTHER AUXILIARY FILES

No auxiliary files changed during this cycle.

4 PDS STATUS

4.1 Instrument Unavailability

All AATSR instrument data was available this cycle.

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	22-Oct-2011 22:04:04	50446	50532	0	3937	0	100.00%	99.24%	99.24%
2	28-Oct-2011 21:44:01	50532	50618	0	0	0	100.00%	100.00%	100.00%
3	03-Nov-2011 21:24:01	50618	50705	0	0	0	100.00%	100.00%	100.00%
4	09-Nov-2011 22:44:15	50705	50791	0	0	0	100.00%	100.00%	100.00%
5	15-Nov-2011 22:24:14	50791	50877	0	0	0	100.00%	100.00%	100.00%

Table 4-1 Instrument and data unavailability weekly summary for Cycle 108.

The instrument was available for 100.00% of the time during the cycle.
The L0 data were available for 99.85% of the time during the cycle.
The L1b data were available for 99.85% of the time during the cycle.

The following L0 data were missing from this cycle:

UTC Start	UTC Stop	Duration (s)	Orbit Start	Orbit End
26-Oct-2011 07:16:55	26-Oct-2011 08:22:32	3937	50494	50495

Table 4-2 ATS_NL__0P missing data during Cycle 108

Data missing at L0 are also missing at L1B. There was no additional missing L1B data this cycle.

4.2.1 ORBITS AFFECTED BY POOR DATA QUALITY

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

During this cycle, no orbits contained frames suffering from bad/missing telemetry.

On 14 November 2011, daily checks were set in place to spot cloud-clearing failures. The cloud-clearing algorithm failed on the following orbit during this cycle:

- 50817 (17 Nov 2011)

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
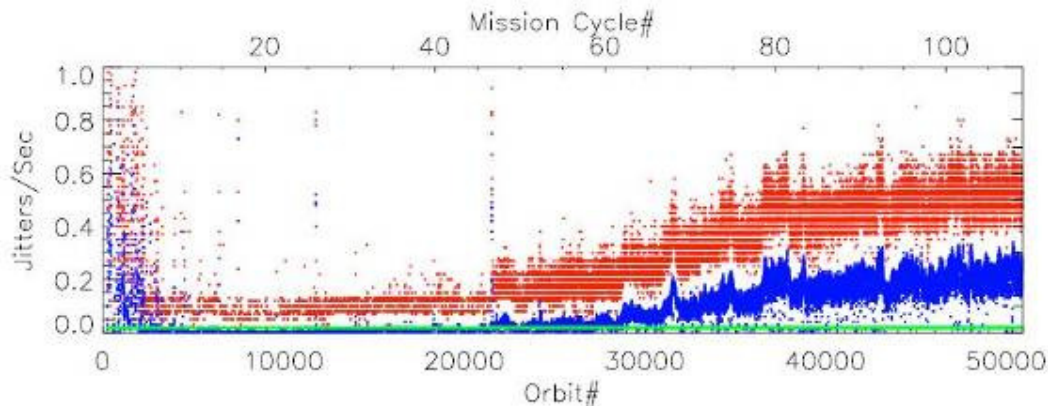
5.1.1 JITTER

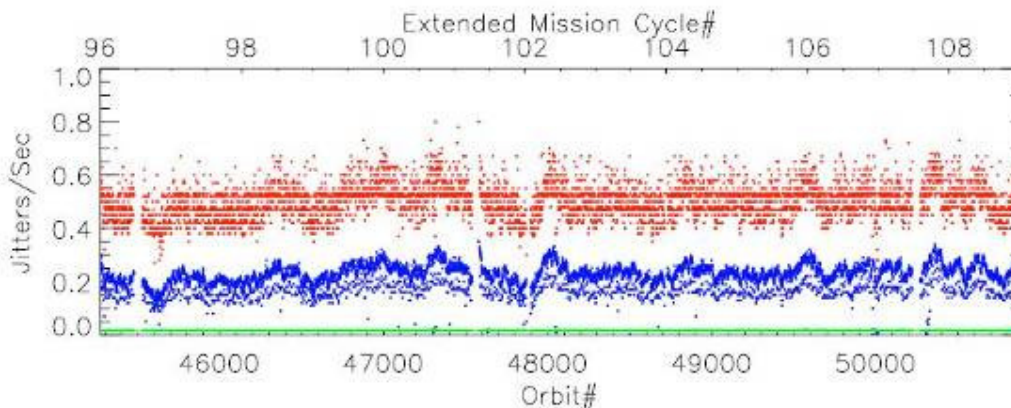**Figure 5-1 Jitter trend from mission start**

Figure 5-2 Jitter trend since the mission extension

The plots show the jitter-trend since the start of the mission and since the recent mission extension, 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 for the extended mission shows no significant change in the mean jitter-rate variation over this cycle compared to that in recent cycles.

5.1.2 SENSOR TEMPERATURE

The detector temperature plots for Cycle 108 can be found at:
http://www.aatsrops.rl.ac.uk/EDSX/CyclePlots/DetTemps108.pdf

Detector temperatures have been nominal throughout this cycle.

5.1.3 VISCAL

NRT calibration quality for the AATSR reflectance channels has been maintained throughout the cycle. The list of "orbital" VC1 files delivered for this cycle can be found at:
http://www.aatsrops.rl.ac.uk/EDSX/CyclePlots/VC-108.txt

5.1.4 NEΔT

No information on the NEΔT is available for this cycle.

5.2 User Rejection

There were no user rejections during this cycle.

5.3 Software Problem Reporting

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

5.3.1 EXISTING SPRS THAT ARE STILL OPEN

The following SPRs are still open:

Wrong REF_DOC in MPH of AATSR products
NA-PR-10-05334
As a result of the AMALFI-2 pilot project, it has been discovered that the REF_DOC field in the MPH of AATSR products is different from the product specification name.
1) The REF_DOC should follow "AA-BB-CCC-DD-EEEE_V/I", 23 characters where AA-BB-CCC-DD-EEEE is the ESA standard document number and V/I is the volume/issue.
2) The referenced product spec is still 3/K. whilst the one applicable, and also referenced in the SRN of 6.03 is 4/A.

AATSR Child Products contain insufficient number of ADS records
NA-PR-08-03912
The number of ADS records present in AATSR child products is insufficient for processing of the entire product. Users are currently advised to order products of at least 1 granule longer to obtain all required ADS records. Excluding the SQADS and the scan pixel x and y ADS, the DPM requires that for AATSR full resolution products, the number of records in the ADS shall be one greater than the number of

MDS granules in the product. Child products are currently produced with a number of ADS records equal to the number of MDS granules in the product. In the case of the SQADS, this is sampled only every 512 rows, rather then every 32, so in order to provide coverage for every granule in a child product, the number of SQADS records strictly required depends on the length of the child product and where the child product starts in relation to the 512 record boundaries. Parent products by definition start on a 512 record boundary, but child products need not. If we define a product segment of 512 consecutive rows (=16 granules) as a frame, then the number of SQADS records required in the child product is equal to the number of frames overlapped by the child product. For the case of the Scan Pixel x and y ADS, the records represent instrument scans, not image rows. There is no simple algorithm to define the number of records from the parent product that should be included in the child product.

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."

Processing of L1/L2 fails with product ATS_NL__0PNPDE20100515_214836_000061722089_00272_42911_1524.N1
IDEAS-PR-10-05411
The problem does not occur in prototype, but in PDGS operational chain and in Gamme validation platform. Processing the following L0 product to L1 and L2 fails ATS_NL__0PNPDE20100515_214836_000061722089_00272_42911_1524.N1.
Please consider that same error occurs also IN GAMME test environment.
19.08.2010 -Feedback from ELCA:"There is just a debug option that has to be removed from the optimization options while building AATSR IPF. When building the IPF with the correct options this error does not occur and the processing completes and generates L1/L2 products."

AATSR MPH OSV field does not agree with SPH auxiliary filename
IDEAS-PR-11-05568
We are noticing that, on occasion, the OSV source field in the MPH does not agree with the auxiliary data file name given in the SPH. For example: (1) in product
ATS_TOA_1PRUPA20110527_222624_000065273103_00029_48319_8139.N1,
the MPH gives the OSV source as "FR", while the SPH reports that the file used was actually an FPO file
(AUX_FPO_AXVPDS20110528_102115_20110527_190825_20110606_212212);
(2) in product
ATS_TOA_1PNPDE20110526_021402_000066813103_00003_48293_4416.N1,
the MPH gives the OSV source as "FP", while the SPH reports that the file used was actually an FRO file
(AUX_FRO_AXVPDS20110528_102115_20110524_221000_20110527_005000).
Note that this does not always happen, but seems to be related to when files are processed using a non-anticipated file type, but not in every instance. ELCA's analysis: "The solution is to compute in output product's MPH the OSV value based on the orbit file passed in the job order instead of using the L0 MPH's value."

AATSR: Reduce the logging noise by removing the warning on jitter
IDEAS-PR-11-05587
The requirement is that the scan jitter warnings are disabled (this information is present in the products themselves, and we are aware and monitoring jitter levels from the operational data anyway). There are numerous warnings of this type, even in the logs from a successful processing run, so they prevent the log from being easily read to diagnose any problems.
We see this also useful for PDGS, since the logging size will reduce.
It is agreed that this change shall be included in the IPF version for the reprocessing.

AATSR:AATSR products non conformance to FODP
IDEAS-PR-11-05594
From O&M: PBI000000004179: 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. We would like to enquire as to the current definition applied to consolidated products and ask that a change be proposed and the impact of such a change evaluated.
This PBI is a copy of the PBI1161. The PBI1161 was corrected via a CRQ but the delivery introduced other problem so the CRQ was discarded. Consequently, the problem described by PBI1161 is still present.

5.3.2 NEW SPRS SINCE THE LAST CYCLIC REPORT

There were no new SPRS opened since the last Cyclic Report.

5.3.3 CLOSED SPRS

There were no SPRs closed since the last Cyclic Report.

5.4 Monthly Level 3 Products

The following plots have been generated from the available Meteo products acquired for October 2011. These consist of 497 products from orbits 50131 to 50575. Figure 5-4, Figure 5-5, Figure 5-6 and Figure 5-7 show the SST average in dual and nadir views, the standard deviation and the number of contributory orbits for October 2011. Figure 5-8 and Figure 5-9 show anomalies of the monthly averages from an SST climatology. Please note that individual colour scales for each plot are not available, however the scheme used is given in **Figure 5-3**, and the data ranges of each plot are specified in the accompanying caption.

Figure 5-3 This is the colour scheme used for the following plots, running linearly from left to right with increasing magnitude
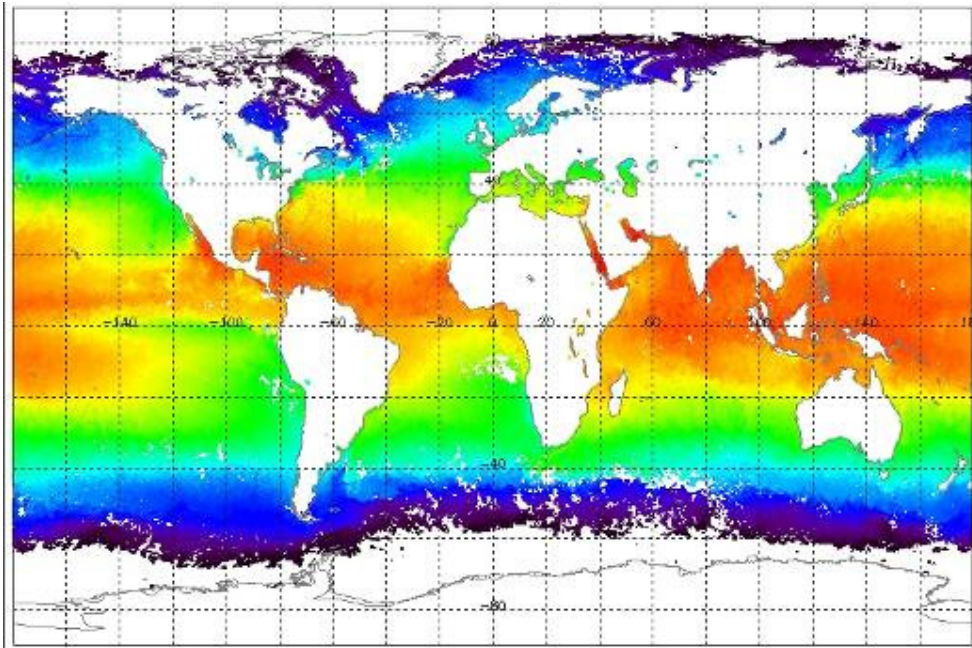

Figure 5-4 Monthly average Dual View SST, with a data range of 270 - 305 Kelvin for October 2011
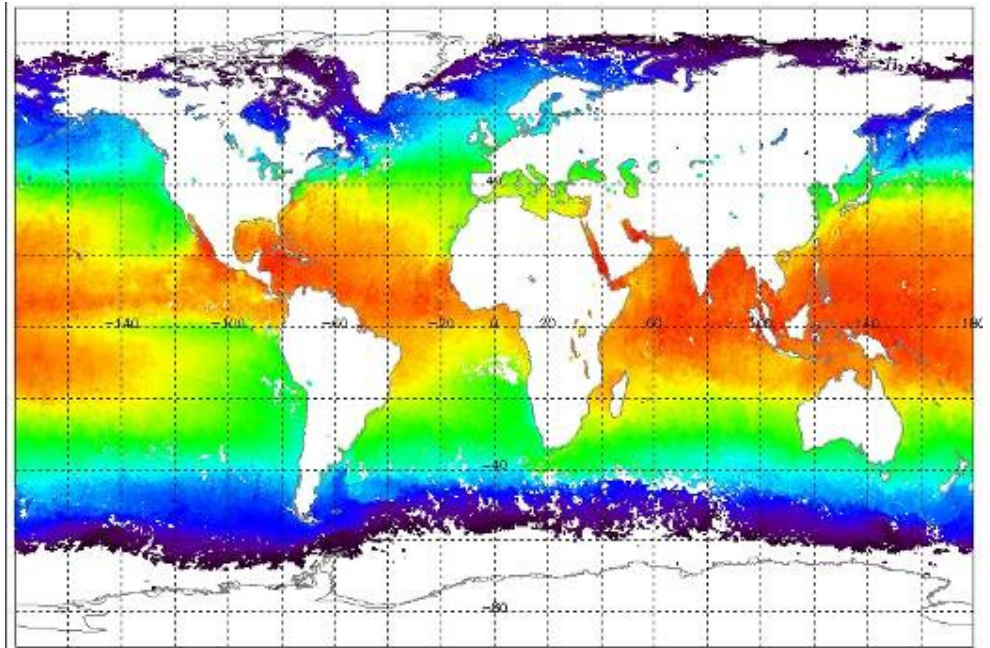
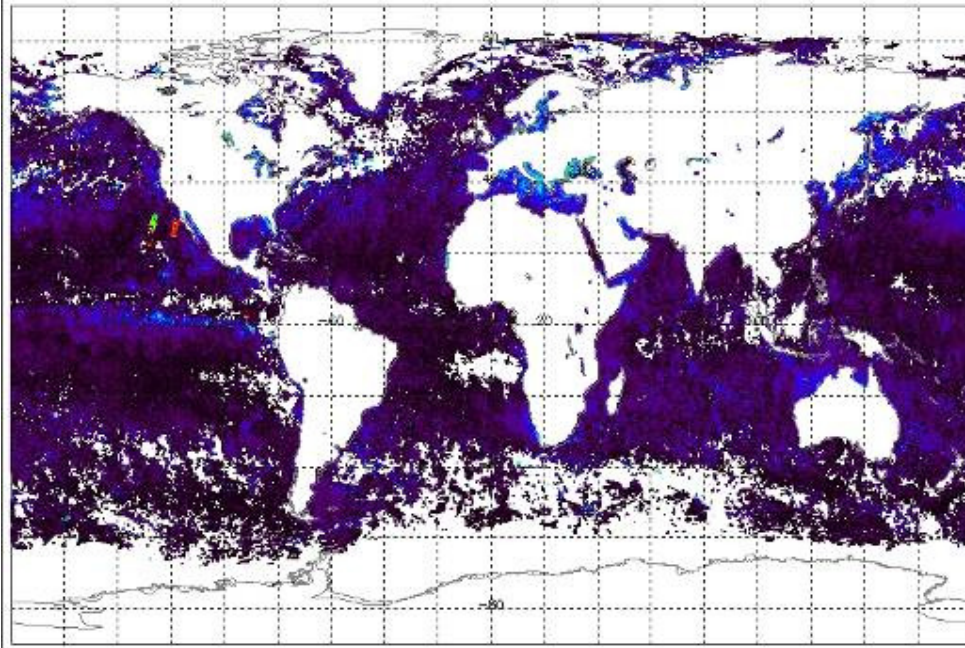**Figure 5-5 Monthly average Nadir View SST, with a data range of 270 – 305 Kelvin for October 2011**

Figure 5-6 Standard deviation of the monthly average SST with a colour key range of 0 to 5 K, and a maximum value of 7 K for October 2011
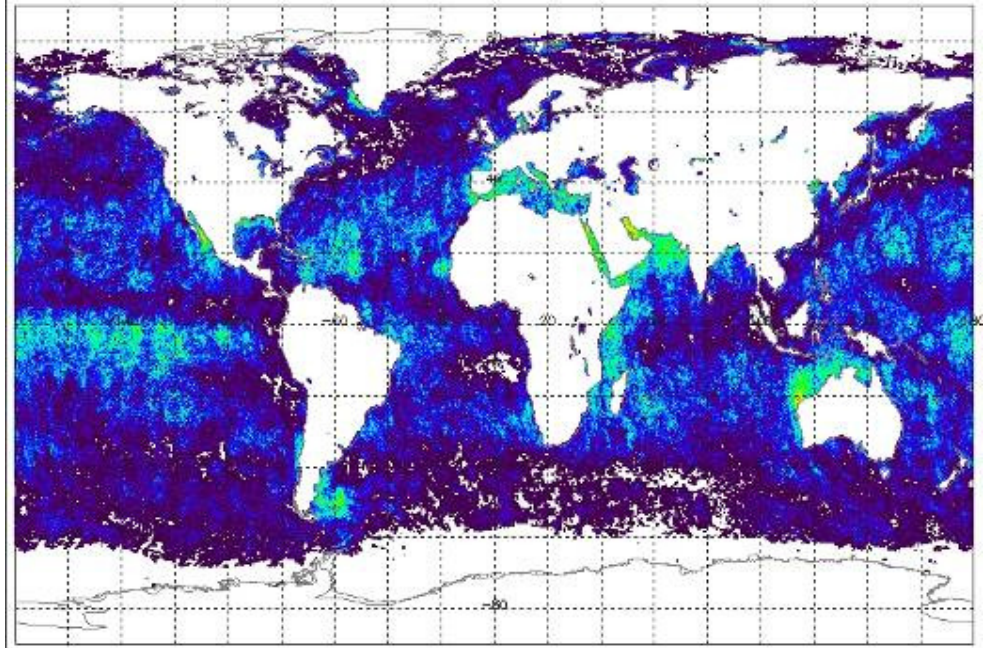
Figure 5-7 Number of contributory orbits to the calculation of the SST, with a colour key range of 0 to 15 (maximum value), for October 2011

Figure 5-6 displays some blocks of high value in the eastern Pacific Ocean off the coast of North America. These can be directly related to cloud-clearing failures in this region. The affected orbits from Cycle 108 are listed in Section 4.2.1. In order to monitor these failures more closely, daily anomaly SST maps are now produced and inspected. Any orbit which is found to have exhibited a cloud-clearing failure is mentioned in the AATSR Daily Report at: http://earth.eo.esa.int/pcs/envisat/aatsr/reports/daily/

Monthly SST anomaly maps, referenced to the GOSTA climatology dataset, are now being produced (beginning at Cyclic Report #106). Figure 5-8 and Figure 5-9 display the SST anomalies for dual- and nadir-view SSTs for October 2011, respectively. The anomaly scale runs from -10 K (blue) to +10 K (red).
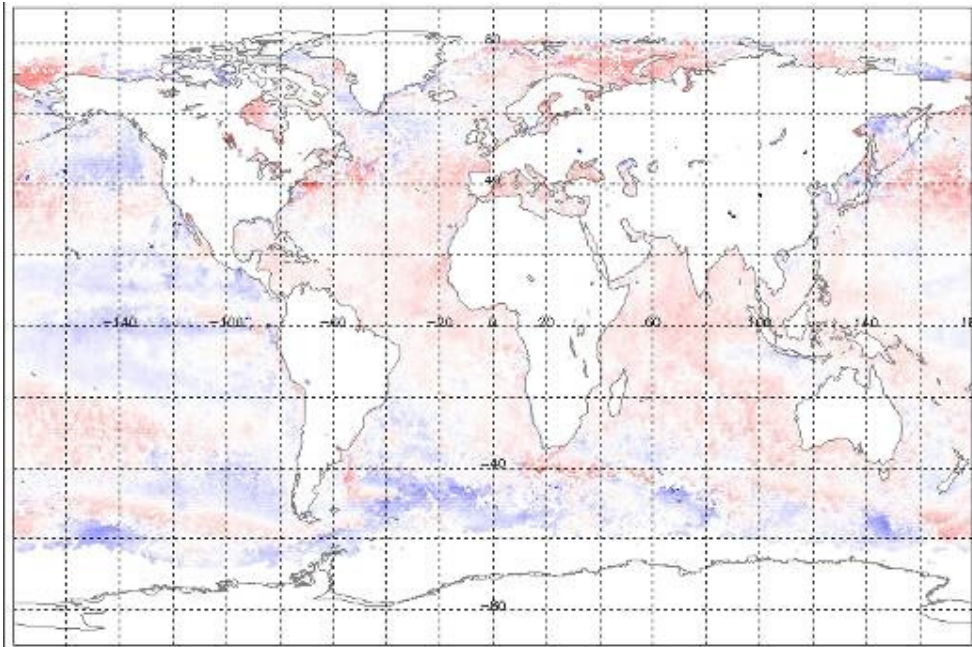

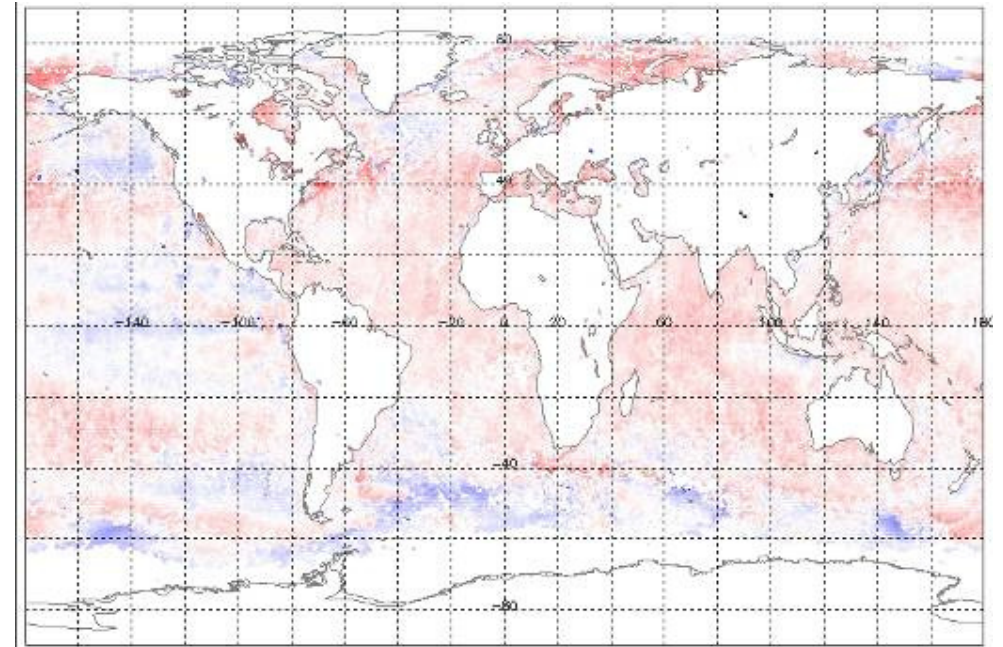**Figure 5-8 Anomaly map of Dual View SST for October 2011**

Figure 5-9 Anomaly map of Nadir View SST for October 2011

6 CALIBRATION/VALIDATION ACTIVITIES & RESULTS

6.1 Calibration

No calibration results were reported during this cycle.

6.2 Validation

No validation results were available for this cycle; they will be reported in the next Cyclic Report.

7 DISCLAIMERS

No new disclaimers have been issued during this cycle.