



RAL ATSR PLS Report to 14th ATSR Core Group Meeting

Covering the period 1st January until 31st March 1999

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1. PROGRESS SUMMARY

Progress has been good again during the last quarter, and many milestones have been achieved. A major review and upgrade of the ATSR WWW pages is now complete, progress towards SST and cloud algorithm upgrades continues, work on the ABT merging tool has progressed significantly, the draft EOS article has been circulated for comment, and the tool necessary for the generation of an ATSR/buoy intercomparison data set is tested and complete. Also, a significant amount of ATSR-1 reprocessing has been completed using raw data from the old ATSR-1 archives so that we can hold the schedule to deliver data in time for the IPCC.

2. INSTRUMENT STATUS

2.1 ATSR-1 STATUS

ATSR-1 is powered off, and only the basic monitoring activities necessary to check basic health and safety and keep the microwave radiometer in operation are being maintained.

2.2 ATSR-2 STATUS

ATSR-2 has operated nominally throughout most of the reporting period, there have been a few occurrences of high power spikes.

3. REPORTS ON INDIVIDUAL WORK PACKAGES

3.1 WP 1000 SCIENCE EXPLOITATION

3.1.1 WP 1100 Scientific Planning and Project Management

Regular meetings have been held of the ATSR PLS Project team to progress all aspects of the ATSR Post Lunch Support Programme.

The annual meeting between the ESA team and RAL took place in ESOC on the 12th March.

3.1.2 WP 1200 Scientific Support

See below.

3.1.3 WP 1300 Underpinning Physics

Work continues on the ongoing items listed in table 2 of the attached Progress Summary.

The major activities currently underway are a) the revision of the ATSR-1 algorithms to account for the effects of detector temperature rise during the mission on the results from the 12 μ m channel, and b) a review of the cloud algorithms. Work in these areas was previously the responsibility of Albin Zavody who retired last year, and this work has now been transferred to other experienced staff. The work is progressing well, and we have taken the opportunity afforded by the transfer of work to undertake a more radical review of the algorithms than was previously envisaged in the project planning. This has been necessary to bring the new staff up-to-speed, and has major benefits to the project in the longer term. This work will result in better overall documentation of the algorithms and configuration control of all the tools used in the prototyping of the algorithms, as well as improvements in the SADIST implementations of all the algorithms.

Test SST retrieval coefficients and calibration tables now exist that account for the effects of the 12 μ m warm-up, these will be used in the near future in a test version of SADIST to evaluate their impact. Further work is currently underway, to include aerosol robustness into these coefficients. Under the current planning, these revised coefficients will be available for application to the ABT products in mid-summer.

Work on the review of the cloud algorithms continues, and is going well. New tools are now available for viewing the various cloud flags and comparing images produced with different cloud clearing schemes. This work is benefiting greatly from new insights we have gained from our ongoing work on the AATSR Prototype processor. Some minor revisions of the SADIST scheme have already resulted from this work, and there is now a much better correspondence between the prototype algorithms and the production versions. Currently, we are trying to address the blocky structure of some of the tests and the sensitivity of certain tests to positioning of the pixel group chosen. New work by Jim Simpson from Scripps Institute has been drawn to our attention, and the possibilities of applying some of the techniques is being considered.

3.1.4 WP 1400 Management Interfaces

The Project Scientist has maintained regular management level contact with ESA counterparts. Discussions are continuing on the International User Group Meeting.

3.1.5 WP 1500 Promotion

The draft article for EOS is now complete and has been circulated to ACG members for their comment.

Final revision of the ATSR User Guide is well underway, and although the deadline for this meeting has been missed, the revised version will be on-line before the end of April.

A significant re-packaging and upgrade of the ATSR Web pages to make them more user friendly will have been completed by the 9th April. The new pages added include instrument status information, processing status information, the H-rate coverage plots for each cycle, the descope for each cycle, the details of the areas covered by the MRF, monthly ASST maps and animations, the User Guide in PDF format, and ACG information.

The normal updates to ATSR World Wide Web pages have been maintained, and abridged versions of the ACG reports and the RAL progress report have been put on-line as requested.

Several e-mail shots to advertise the ATSR Workshop have been undertaken. The event has been added to EOS IWG calendar, the BADC calendar, and AGU will publicise it on their Web site and in EOS.

3.2 WP 2000 IN-FLIGHT OPERATIONS

3.2.1 WP 2100 System Management

The software, hardware, and data links necessary to support the ATSR-1 and 2 instruments have been maintained throughout the period.

The annual joint ESA/RAL ATSR Operations Meeting took place at ESOC 12th March. Representatives from ESTEC, ESRIN and ESOC met with 3 members of the RAL project team

3.2.2 WP 2200 Instrument Operations

ATSR-1

Nothing to report. ATSR-1 is powered off, and only the basic monitoring activities necessary to check basic health and safety and keep the microwave radiometer in operation are being maintained.

ATSR-2.

The instrument has continued to run nominally except for the anomalies and incidents reported below:-

scan mirror power spike - 23 Jan. 1999 023:22:45:43 UTC at 61.2 watts

scan mirror power spike - 28 Feb. 1999 059:06:50:22 UTC at 48.9 watts

scan mirror power spike - 07 Mar. 1999 066:16:27:27 UTC at 66.0 watts

scan mirror power spike - 20 Mar. 1999 079:22:06:09 UTC at 72.5 watts

During the whole period ATSR-2 VISCAL data has been processed routinely from three orbits/day and results from this are available on:

http://www.atsr.rl.ac.uk/html/calibration_table.html

Support from ESOC for ATSR-2 continues to be excellent.

3.2.3 WP 2300 Monitoring

For ATSR-2 detailed daily monitoring has been maintained in case the scan anomaly recurs, whereas for ATSR-1 only a basic health and safety check is being maintained

3.2.4 WP 2400 Troubleshooting and Diagnostics

Fortunately, no action has been required under this work package this quarter apart from what is listed above.

3.2.5 WP 2500 On-board Software and High-level Documents

No work required during this period.

3.2.6 WP 2600 ATSR-2 X-band EDS development and Maintenance

There has been no further work in this reporting period.

3.2.7 WP 2700 Maintenance of the S-Band EDS-1/2

The S-band system continues to function nominally with no problems to report.

3.3 WP 3000 CALIBRATION AND VALIDATION

3.3.1 WP 3100 Calibration and Validation Planning

Since the last ACG meeting we have confirmed participation in the following cruises this year:

1. NAURU99: Cruise organised in north Pacific, June and July 1999.
2. MITEC: Participation organised in two week radiation budget experiment off the coast of Norway, last two weeks of August, 1999.
3. AMT-9/ROSSA99: Participation expected, September and October 1999.

We have also established a preliminary arrangement with the Scripps Institute to deploy SISTeR as part of the CalCOFI cruise series, which takes place one month in every three in Pacific off San Diego. Initially this will be a single deployment on a trial basis, but it is planned that this will become a regular fixture with one of the SISTeRs deployed almost permanently at Scripps.

Further deployments for 1998/99 are being planned, with the current schedule there is no pressing need to have the 2nd instrument operational before the early summer.

3.3.2 WP 3200 Infrared Calibration and Validation

New SISTeR signal channel and thermometry boards completed and commissioned. New mechanism board nearly complete. New scan mirror and scan mirror mechanism parts designed and manufactured.

New SISTeR multi-look calibration code written in IDL.

Contributions made (2nd author) to paper on oceanic "skin effect" and to IGARRS poster.

Submitted MSG AO letter of intent for SEVIRI/ATSR-2/AATSR/SISTeR/ISAR cross-validation.

3.3.3 WP 3300 Visible Calibration and Validation

Work on the long term monitoring of the visible channel calibration and the inter-comparisons with other sensors continues.

3.4 WP 4000 ALGORITHMS

3.4.1 WP 4100 Algorithm Management

3.4.2 WP 4200 Algorithm Development

Reported under Science support, as the current work relates to improvements in the algorithm coefficients and a review of the cloud algorithm and its performance.

3.4.3 WP 4300 Algorithm Maintenance

Other than those reported above, no significant maintenance activities have been required during this reporting period.

3.5 WP 5000 DATA PROCESSING SOFTWARE

All components of the software to enable the generation of the "ATSR SST Intercomparison Kit" are now in place and tested ready for operational use. This includes the buoy-overpass match-up program, automatic generation of SADIST-2 request files and jukebox control files and QA software to confirm all products really do contain the buoy location. This system allows one month of buoy overpass products to be generated in about two days, if other routine data-processing continues in parallel. If the entire operational data-processing system was devoted to the task, the data set could be completed in about two weeks. At the time of writing, further processing is in abeyance pending assessment of the products generated to date. A status report has been prepared and will be circulated to ACG members.

Prototype ABT-reformatting software is now ready. This software co-locates forward and nadir view into the same record. It operates on single SADIST-2 ABT products and takes, on average, five minutes (elapsed time) to co-locate a single orbit product. To make the co-located ABT product even more convenient to use, the software is currently being enhanced to operate on successive ABT orbit products consolidating them so the "missing" 900 km forward view at the start of each orbit is included by transferring it from the previous orbit product. Thus, each new co-located ABT will have complete nadir and forward views in the single product. The idea to perform ANX-to-ANX consolidation, reported last time, has been dropped because much of the header information in the original SADIST-2 ABT products is summary information for that orbit only and so there would be unavoidable ambiguity in the header information of an ANX-to-ANX product created by merging two SADIST-2 (dump-to-dump) ABT products.

3.5.1 WP 5100 Software Requirements

The proposed meeting to discuss the possibility of merging the AATSR Reference Processor and SADIST-2 software is still pending. A common ATSR/ATSR-2/AATSR product format would allow much easier inter-comparison and thereby promote use of the ATSR-series. That being said, the work entailed will require investment from some interested funding agencies as it will run into several staff-months effort to implement and test the new software required.

3.5.2 WP 5200 Software Maintenance

The archiver software for the re-transcribed ATSR-1 LRDAF tapes has been implemented and tested against the sample LRDAF tapes received to date. The corresponding modifications to the preprocessor, to read the new LRDAF catalogue, are underway and will be ready for the operational delivery of the re-transcribed data.

The planned Y2K testing of the SADIST-2 system has been delayed while awaiting the LRDPF test input tape from ESA/ESRIN and the Y2K compliant version of the ERSORB orbit propagation software from ESA/ESTEC. The former is now due at the end of March and the latter in Mid-April.

No new Software Problem Reports have been received.

3.6 WP 6000 DATA HANDLING

3.6.1 WP 6100 Data Management

State Vector information from ESRIN has continued to be transferred to RAL over the IP link which has been reliable.

3.6.2 WP 6200 Archive Improvements and Population

The missing orbits for ATSR-2 have been reduced to 3 orbits. Some other orbits have been lost due to some of the raw data tapes failing. These orbits are being re-acquired from ESRIN and the situation is being monitored.

See below for the status of re-transcribed ATSR-1 data.

3.6.2.1 WP 6201 Data Archive Maintenance

The ATSR-1 missing orbits will be addressed by the LRDAF re-transcription. This data is still awaited from ESRIN and a revised date for the start of shipment of 1st April 1999 has been suggested by ESRIN.

3.6.3 WP 6300 Primary Mission Processing

ATSR-2 processing continues. So far all data to February 1999 has been processed and products made available via FTP.

A WWW Page has been released showing GIF images constructed from the raw data- including yearly animations- and information as to how to download the ASST products via FTP. This page was well reviewed in The Guardian newspaper recently.

A WWW Page describing the areas covered by the MRF has been completed and will be on-line in the very near future.

3.6.3.1 WP 6301 Browse Population and Operation

The ABF continues to be populated with GBROWSE products, although recently ingestion problems on the ABF have slowed the rate of population.

The current problems with the ABF reported in the previous ACG report are now being addressed by EOS and RAL.

RAL will provide a high-level audit of the ABF in order to investigate possible missing data.

3.6.4 WP 6400 Full Resolution Data Processing for the NERC Community

During the first quarter of 1999, 14 requests for full resolution data have been received of which 8 have been completed. One other has been incorporated into the MRF processing. Over 25,000 products have been distributed.

None of the requests outstanding requires further input from the ACG.

3.6.5 WP 6500 Reprocessing

In view on the and the continuing delays in the LRDAF re-transcription and the pressing need to get the ATSR-1 reprocessing underway if we are to finish by November 1999 to meet the IPCC deadline, it has been decided to start the production of ABT/GBROWSE products from the existing LRDTF/LRDPF data set. Processing has started from January 1994 and will continue until the end of the data set in June 1996. A timetable has been devised and published on the WWW (as per ATSR-2). So far, data from January 1994 to March 1994 has been processed. The ABT products produced have been written to Exabyte tape.

Due to the problems with the temperature of the 12 micron channel during this part of the ATSR-1 mission, it has been decided not to generate the level-2 hi-resolution products until the retrieval has been adjusted for this. The ASST products generated will be placed on the WWW with an appropriate warning.

The ACG should note that if we are to meet the IPCC deadline of November 1999, we need the re-transcribed data and it is imperative that ESA delivers the key data from July 1991 to December 1993 by the end of the summer.

3.6.6 WP 6600 Order Handling and Distribution

See reports under above work packages.

4. WP 7000 HIGH LEVEL MANAGEMENT

4.1 WP 7100 OVERALL RAL PROJECT MANAGEMENT

Regular progress meetings with the Project Scientist and the EO Data Group Leader have been held to progress work.

5. PLANS FOR THE NEXT QUARTER

The specific milestones for the next quarter are given in Table 2 of the attached progress summary, plus the following list of standing activities:

- Continued operational support for the ATSR-1 and -2 instruments.
- Continued ATSR image product service.
- Continued routine ATSR-2 ASST processing.
- Continued routine ABF population and image generation through the Master Request File.
- Continued support for routine ABF operations to users.
- Completion of the ATSR-1 reprocessing algorithm.
- Updating of the ATSR Web pages