(A)ATSR Open Issues

33rd AATSR QWG
ESRIN, 14th & 15th September 2016

TELESPAZIO
a LEONARDO and THALES company

AATSR QWG Open Issues List

Items are split into:

- Issues associated with SLSTR-format products and processing

- Other (A)ATSR Open Issues

Items come from:

- (old Data Quality Issues doc)

- QWG discussions

- Reports of problems with (A)ATSR data

Note: some overlap with the Validation Issues Report maintained by Validation Scientist (University of Leicester)

The list of open issues is discussed at each QWG meeting and updates recorded in the presentation as distributed with the minutes of the meeting.

(Updates from the discussions during this QWG are noted in blue when published after meeting)

Considerations for SLSTR-format products & processing (1)

Orthogeolocation

- Will be implemented in FAST (new L1B) processor, using same EO CFI and DEM as SLSTR
- **Status: in progress (query on feed through of orthogeolocated data within ATBD)**

Coregistration

- Improvement likely to be implemented for AATSR with new CH1
- *ATSR-1/-2 still to be determined*
- **Status: AATSR 4th reprocessing L1B products needed in order to update AATSR CH1**

Swath Width

- Product grid width will be 512 km; all extra swath data will be placed in the orphan pixel bucket
- **Status: no open questions**

Product Grid

- (A)ATSR data in SLSTR-like format will be given on a 1-km grid
- **Status: no open questions**

Considerations for SLSTR-format products & processing (2)

Surface Classification

- Sentinel-3 surface classification masks to be used by FAST (most recent set from Brockmann Consult)
- **Status: no open questions**

Cloud Masking / Flags

- Basic (SADIST) cloud masks will be applied via an immediate post-processing step
- A later post-processing step will ingest Bayesian cloud (ocean, inland water) and probabilistic cloud (land) information (masks and probabilities) in the L1B products
- **Status: no open questions**

Uncertainty Estimates

- RAL have defined a scheme for providing per pixel estimates; BT and AATSR radiances complete
- **Status: ATSR-1/-2 radiance uncertainties procedure and inputs not defined**

Meteo Annotations

- Intended to match SLSTR specification (60 levels), but FAST is following product specification (25 levels)
- Ozone and snow albedo now added to product spec
- **Status: DSI will download ECMWF ERA-Interim data**

(A)ATSR Open Issues (1)

Previously open issues expected to be resolved by SLSTR-format products & processing:

- (A)ATSR Geolocation
    - Use of ortho-geolocation, and restituted aux data for ATSR-1/2, expected to improve absolute nadir geolocation and view colocation. Any further assessment stalled until after 4th reprocessing

- AATSR Land/Sea Mask
    - Use of the Sentinel-3 surface classification masks expected to give an improvement

Issues relating to SADIST-based cloud tests

- These are now obsolete, as the implementation for 4th reprocessing will be to provide heritage with v3 data, so no improvements / adjustments to be made

- The list of issues has therefore been moved to the end section of this presentation and will not be addressed further

(A)ATSR Open Issues (2)

AATSR / ATSR-2 12 μm BT Offset

- QWG recommended that an Appendix be added to the official report, outlining all recent findings; user recommendations will also be updated

- It is not anticipated that any substantial further work will be carried out

- The calibration corrections will not be implemented in the 4th reprocessing

- **Status: Report and user documents to be updated; further research work on-hold**

(A)ATSR 11 μm and 3.7 μm Discrepancies

- Following the investigations recommended by the ARB, it appears that the 11 μm channels are ok but further work may be of benefit for the 3.7 μm channels.

- A report should be produced on these investigations and activities to address the 3.7 μm channel discrepancies are to be proposed (Action QWG30-04, DS)

- **Status: activity completed; user information has been produced as a FAQ item**

(A)ATSR Open Issues (3)

ATSR-2 data after June 2003

- Products have been generated and are in the NEODC archive

- Request has been made to ESA to archive in DissHarm (discussions ongoing about transfer)

- **Status: ?Completed**

ATSR-1 Channel Switching (1.6 µm / 3.7 µm)

- RAL have discovered the "missing" 1.6 µm radiance data are available in the UCOUNTS products, but the BB data are not, hence SADIST-2 flagged as calibration unavailable and did not put in UBTs

- RAL have proposed a solution that necessitates reprocessing from L0 and filling in the BB data from an ADF to provide calibration for the 1.6 µm channel

- A correction to include the 1.6 µm radiance data in the UBTs may be implemented for the 4th reprocessing

- **Status: ?RAL activity on-going**

(A)ATSR Open Issues (4)

ATSR-1 & ATSR-2 Data Availability

- Gaps during ATSR-1 commissioning, and at start and end of ATSR-2 mission – will be compared against "master" ERS datasets once available

- Depending on timeframe for completion of the master datasets, the extra data may be available for inclusion in the 4th reprocessing (assuming the L0 can be processed), when ATSR-1/-2 is processed

- **Status: ESA activity on-going (RAL have DECC-funding for follow-on activities)**

ATSR-1 Data Artefacts (UBT Blemishes)

- Artefacts present for last portion of some tapes; agreed census of affected UBTs would be useful

- May be possible to resolve with data from ESA ERS master datasets

- RAL now have the capability to process ATSR-1 data from L0

- **Status: ESA activity on-going (RAL have DECC-funding for follow-on activities)**

(A)ATSR Open Issues (5)

ATSR-1 Erroneously Calibrated BTs

- Current algorithm cannot cope with missing/off-scale BB temps or counts.

- Suggestions have been to either flag affected data, or propose new algorithm

- RAL are to address this issue via flagging of affected data

- **Status: RAL activity on-going**

ATSR-1 Pick-Up Noise

- Noise is caused by pick-up of cooler drive on the detector signals.

- Constant with time, so minor impact on long-term SST record but may impact other studies using imagery (e.g. ocean front detection)

- Had been agreed that no further action to be taken on this issue; however SAG Nov 2015 opened the item again, negating the user note to explain the issue to users (Action QWG30-05, BM and Action QWG30-06, IDEAS+)

- **Status: ?**

(A)ATSR Open Issues (6)

ATSR-1 Detector Temperatures

- Calibration error due to temperature dependence is max. 0.005 K

- There is also a contribution to calibration error from temperature dependent detector non-linearity effects, which gives a max. combined error of 0.01 K

- The TN proposes a correction for calibration error based on detector temperature and the black body temperatures, and a (less rigorously derived) correction for including non-linearity effects

- Next step is to analyse the impacts from the results in the TN.

- **Status: *stalled*** (other activities have higher priority); TN to be published with 3rd reprocessing user information

(A)ATSR Open Issues (7)

AATSR Level 0 Completeness

- Further investigation (July 2015) of Third Reprocessing AATSR consolidated L0 gaps vs lists of NRT L0:

- 13 recovered NRT L0 for consolidation (HSM anomaly)

- 307 NRT L0 identified that were not reconsolidated for 3rd reprocessing

- Gaps in NRT L0 lists identified by comparing 2nd and 3rd reprocessing dataset

- **Status: DSI to attempt gap filling / reconsolidation prior to 4th reprocessing**

AATSR Consolidated Products Coverage

- AATSR L1/2 products are not ANX-ANX. Problem Report was raised on AATSR IPF, however problem is not in the processor but in the orchestration of the processing.

- An FAQ item has been produced explaining how users can remove the overlap

- **Status: This is being corrected in FAST implementation (TVUK) – padding to full orbit is also being explored**

Record of Obsolete Issues

Issues relating to SADIST-based cloud tests

- ATSR-1/ATSR-2 gross cloud test thresholds

    Would need regenerating as done for AATSR prior to 3rd reprocessing

- Cloud mask failure in sun-glint regions

    Would need investigation into failures & improvements to be defined

- Land cloud mask poor performance

    Would need investigation into problems (e.g. urban areas always flagged as cloud) & improvements to be defined

- (Infrared Histogram Test)

    (test is extremely sensitive to starting point / processing environment – only recorded for information)

THANK **YOU** FOR YOUR ATTENTION

TELESPAZIO
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