

SCIAMACHY Quality Working Group (SQWG3)

Progress Meeting 4

Telecon

22 September 2015, 09:30 – 14:30

Minutes

Version 3

Participants:

T. Hilbig (partly), K. Bramstedt, S. Noël, K. Weigel, P. Liebing, F. Azam (partly) (IUP)
A. v. Gijssels (KNMI)
A. Dehn (until ~14:00), G. Brizzi, T. Fehr (until ~14:00) (ESA)
C. Lerot, D. Hubert (BIRA-IASB)
G. Lichtenberg, S. Gretschan, M. Hamidouche, S. Slijkhuis (partly) (DLR Oberpfaffenhofen)
R. Snel (SRON)

Agenda: See 00_SQWG3_PM4_Agenda_v2.pdf

1 Project Status

1.1 General/contractual issues (ESA/all)

- A. Dehn will take over the SQWG-3 project from T. Fehr for ESA.
- CCN extension of the project to include verification/validation of reprocessed products:
 - Currently prepared by A. Dehn
 - Include MULTI-TASTE activities from BIRA for L2V6/7 validation in SQWG
 - This makes it necessary to:
 - Extend the SQWG3 project by about 6 months, as the current QWG schedule foresees only the time until reprocessing and the validation activity will be possible only after the reprocessing is completed.
 - Add some budget for management
 - Add some budget for a technical WP to analyse the validation results and their consequences.
 - Details need to be discussed and the extension needs to be formalized.

1.2 Status reprocessing L1V8, L2V6 (ESA/DLR)

Presentation by G. Brizzi: Reprocessing activities
(See: 01_SQWG3-PM4_ESA_on_reprocessing.pdf)

- Some issues with L1V8 data products were detected.
- Main issue: about 10% of orbits contain single corrupted/incomplete states (see also presentation G. Lichtenberg below)

- New scial1c 3.2.6 release is ready and will be released with L1V8.

AI-PM4-01 ESA (G. Brizzi): Provide scial1c 3.2.6 to SQWG

- L2 FAT is completed.
- L2 processing is on hold until the L1V8 issues is solved.

Presentation by G. Lichtenberg: Corrupted states in L0-1 V8
(see: 02_sgp-corrupted-states.pdf)

- There are missing/incomplete data in L1 due to incomplete L0 data (~5000 orbits).
- These are not correctly filtered out by current 0-1 processor.
- Further checks are ongoing; fixing /filtering out may affect L1V9 and will take at least 4 weeks.
- New version L1V8.02 will be created for the effected data.
→ This causes a delay of the release of L1V8 of 2 months at least.
- L2 processing will be started after L1 is corrected and released
- The anomaly and its resolution has an impact on the MTR readiness and preparation, as resolving the anomaly in Level 1b has priority over the evolution work. As a consequence it was agreed to postpone the MTR and instead organise the PM5 at end of November. The place for this PM needs to be defined
- **Telecon** (between ESA, DLR and IUP Bremen) for technical status and schedule discussion will take place on **5 October 15:00**

2 Level 1 Results

2.1 WP2160: Individual pixel characterization for DBPM characterization (SRON/ DLR-IMF)

Presentation by G. Lichtenberg: Status Operational Processor V9
(see: 03_sgp-l01-status.pdf, covers also WP2140, WP2220, WP2240, WP2250, and WP2260)

- Data base was delivered to DLR and implemented with some configuration options and switches
- Only for channel 8, old DBPM for other channels
- Final tests to be done
- Documentation provided to DLR

AI-PM4-02 SRON: Send DBPM documentation to SQWG

- No open issues

2.2 WP2220: Investigate/improve dark correction (SRON/DLR-IMF)

- Open: Use SDMF V3.0 or V3.2
- SRON scientist recommend V3.0 because of bad orbits in V3.2

Presentation by G. Lichtenberg (see 2.1 WP2160)

- Implementation pending, low risk expected.
- Discussion on the implementation of V3.0 or V3.2:

- ➔ It was decided to implement only V3.2 because it is better documented and should be comparable to V3.0 in quality if bad orbits are removed.
- ➔ Implement both would be problematic because of format changes.
- Removal of bad orbits from V3.2 and exchange of data base will be done after the implementation because it does not affect the work necessary for the implementation.

AI-PM4-03 SRON: Provide a list of invalid darks for V3.2 to be filtered out/flagged to DLR

2.3 WP2240: Investigate/improve spectral calibration ch 6+ (DLR-IMF)

Presentation by G. Lichtenberg (see 2.1 WP2160)

- Done, but testing not started yet, some schedule risk expected.
- Priority of WP2240 is comparably low.

2.4 WP2250: Investigate/improve spectral calibration channel 8 (SRON/ DLR-IMF)

Presentation by G. Lichtenberg (see 2.1 WP2160)

- Parameters and documentation were delivered.
- Analysis is not complete, but only an update of polynomial coefficients is required.
- No problems or risk expected.

2.5 WP2270: Investigate/improve pointing (IUP/DLR-IMF)

Presentation by K. Bramstedt: Improved Pointing Knowledge for SCIAMACHY (see: 04_SQWG3_PM4_pointing.pdf)

- Documentation was delivered, including new mispointing angles.
- Consistent results for all light paths
- Impact on L2 is expected to be small, maybe visible by large averages. Therefore, it is difficult to decide based on L2 data if the new mispointing angles are better.
- Some time dependence is seen in the lunar, solar and subsolar states, but further, time dependent corrections are beyond what can be done now.
- No problems expected for implementation

2.6 WP2120: Investigate/improve ESM diffuser solar reference spectra (SRON/DLR-IMF)

- Improved ESM angle dependence (time dependent part of ESM calibration) is missing in current mirror model; it is available at SRON, but not distributed yet.

AI-PM4-04 SRON (R. Snel): Sent updated mirror model code, documentation and related data base to K. Bramstedt and DLR, especially provide ATBD for time dependent part of the ESM diffuser

AI-PM4-05 IUP (K. Bramstedt): Provide ATBD for current status of the mirror model

- Effects on schedule to be checked in October.

2.7 WP2140: Investigate/improve degradation correction (SRON/IUP/DLR-IMF)

Presentation by G. Lichtenberg (see 2.1 WP2160)

- Interfaces not changed
- Updates: mirror model code, m-factor files,
 - ➔ ESM diffuser update in mirror model needed, see 2.6 WP 2120.
 - ➔ Effects on schedule to be checked

2.8 WP2150: Investigate/improve polarisation key data (SRON/IUP/DLR-IMF)

- Covered by update of mirror model, see 2.6 and 2.7

2.9 WP2260: Investigate/improve polarisation determination and correction (IUP/DLR-IMF)

Presentation by G. Lichtenberg (see 2.1 WP2160):

- CHEOPS implementation is 60% complete.
- Uses O3 V5 data base as input.
- Low schedule risk
- Not possible to be included in current L1b format, therefore tests are only possible with the new format.
- The new format cannot be used by most teams at the moment.
- Possible options how that is solved best need to be discussed
- This is also an issue for UV limb.
- Combined schedule with dependencies for several teams required

AI-PM4-06 DLR (G. Lichtenberg): Provide overview of schedule dependencies (created by Taskjuggler) until mid October.

Presentation by S. Noël: A new algorithm to estimate polarization in the UV for SCIAMACHY limb measurements (See 05_SQWG3_PM4_Noël_UVPol.pdf):

- New algorithm described in TN
- LUTs can be provided
- Requires calibrated reflectance as input
- DLR will look into effort and implementation options
- Probably lower priority, less impact on L2

Presentation by P. Liebing: New Polarization Algorithm (See: 06_PolAlgoPM.pptx)

- New algorithm available (presented before), documentation under preparation

AI-PM4-07 IUP (P. Liebing): Deliver TN on new polarization algorithm (in two weeks latest)

- IB scale factors need to be redone with new mirror model / keydata
- SCIATRAN simulations were used to create LUTs
- Problem with bad pixel mask leading to invalid data in new OBM m-factors
- Possible solution: Filter/interpolate m-factors using static DBPM from P. Liebing
- Algorithm will possibly not be implemented before MTR, first the TN needs to be checked to estimate the necessary effort.

- Limb MME:
 - ➔ Use fitted keydata?
 - ➔ Only for PMDs available, no information on science channels.
 - ➔ It would be better to use only one set of key data for consistency.
- Possibility to implement the new algorithm and the necessary time frame needs to be discussed between DLR, SRON and IUP to provide a consolidated viewpoint and recommendations to agencies.

V9.02 problems

- Degradation correction: Time dependence: irradiance varies by 1% over time at some wavelengths
 - ➔ To be expected, should cancel in reflectances
- SMR In-band signal variations
 - ➔ Design feature / aperture effects
- V8 memory effect: virtual sum: offset for 1st readout in state
 - ➔ 1st readout is skipped in SMR calculation
 - ➔ Possibly effects in nadir (first readout in each state could be affected)
 - ➔ Should be marked in README file

3 Level 2 Results

3.1 WP3140: Limb cloud flagging (IUP/DLR-IMF)

Presentation by P. Liebing: A new Algorithm for LIMB Cloud detection (See: 07_limb_clouds.pptx)

- The new algorithm is better for discrimination between aerosol and clouds.
- It has a better sensitivity to thin clouds.
- The TN is almost ready.
- Open: should smoothed probabilities be used?
- Possibly add value signaling high aerosol load in addition to cloud flagging (requires some analysis).
- Thresholds should be configurable.
- Necessary inputs for DLR are:
 - Cloud probabilities
 - Statistical parameters
 - Land-sea-mask
 - Special DBPM for ch 6+

AI-PM4-08 IUP (P. Liebing): Provide TN for limb cloud detection and inputs for new flagging to DLR

- Implementation after MTR is probably possible.

3.2 WP3240: Tropospheric BrO (BIRA/DLR-IMF)

Presentation by S. Gretschan: Tropospheric BrO: current status (See 08_BrOtropoStatusSQWG_22sep2015.pdf):

- Input was implemented in prototype processor.

- Main issue: Problems with OCRA/SPICI at high latitudes (ice seen as cloud), the information which is necessary to fix this is probably available in the processor.
- To be implemented after MTR

4 General

4.1 Status of AIs (IUP)

Presentation by S. Noël: SQWG-3 Action Items and Schedule
(See 09_SQWG3_PM4_AIs_Schedule.pdf)

- AI-PM3-4 is closed, only V3.2 will be implemented and bad orbits will be filtered before (see 2.2, WP2220)
- AI-PM3-5 is closed, spectral calibration coefficients were provided (see 2.4, WP2250).
- AI-PM3-6 is closed, polarisation in nadir remains to be checked as part of normal work.

4.2 Schedule / Work Plan (all)

- **Telecon: 5 October 3pm** to discuss technical status concerning L1b corrupted states and consequences for schedule
- **MTR shifted**, probably to end of January 2016 or begin February
- Several activities have to shift with MTR
- **PM5 instead of MTR on 24/25 November**, place to be defined

4.3 Preparation of MTR (all)

- MTR will be the second next meeting.
- IUP (S. Noël) will send around draft agenda.
- Progress meeting 5 will be shifted to the planned MTR date (24.-25. November 2015)
- ESA should invite agencies for the MTR and announce that the original date was cancelled where necessary.

AI-PM4-09 ESA (A. Dehn): Provide doodle for new MTR date (January/February 2016)

4.4 Validation results L2V6 (BIRA)

Presentation by D. Hubert : Upgrade from SGP V5.02 to V6.0
(See 10_20150922_SGP56_deltaval__TASTE.pptx)

- Reduced Nadir O3 bias
- Main issue: Nadir O3 long term drift in NH about 1.5%, due to degradation correction. It was seen also in previous results from C. Lerot, but now it is clear that a drift compared to ground based measurements was introduced.

AI-PM4-10 BIRA: Value of ozone drift (1.5%) needs to be checked.

- NO₂, BrO nadir few differences between V5.02 and V6
- CO quality similar as before, but still inadequate in precision and accuracy

- BrO limb results probably affected by a-priori, possibly use only 1 profile per state to increase signal
- Recommendation to reprocess the L2 data based on L1V8, but mention issues in disclaimer.
- Check if the same issues exist with L1V9 when L1V9 is available.

4.5 AOB

- Living planet contributions from SQWG expected:
 - Overview for L1V9 (DLR)
 - Overview for new developments in L2 (DLR)
 - Additional contributions from team to specific topic are welcomed
- Next ACVE will take place in October 2016, some L1V9 and L2V7 results should be shown there.