



# SCIAMACHY

## *Ground Segment Status*

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## Overview

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## 2. The starting point

### 👉 The ACVE-1 (December 2002)

#### □ Conclusions & Recommendations

- Fix all level 1b problems
- Dark current to be determined/applied orbit wise (7&8)
- Pixel to Pixel gain optimization/non linearity correction (7&8)
- Etalon correction factor for all Reticon channels (1-5)
- Fix problems with offset in solar calibration/reflectance
- Improve spectral calibration, increase the number of lines, used for fit
- Polarisation I: correct/improve determination algorithm
- Polarisation II: fix problem in application routine (SciaL1C)
- Observation geometries to be consistently provided for TOA

👉 These were just the highlights!

## 2. The way

- ☞ The so called master plan was set up
  - An initiative from the AO-provider, ESA and science representatives
    - Activation in early 2003
    - Identification of all open processing issues
    - Definition of priorities: UV-before IR, Nadir before limb
    - Regular progress tracking
  
  - The level 1b verification workshop
    - Hosted by DLR-Oberpfaffenhofen in December 2003
    - Input: A number of special test cases + 2 nominal scientific orbits
    - Conclusion: we have a useful level 1b product for UV-VIS
    - Remaining deficiencies could be summarized in a disclaimer
    - Some final recommendation for the processor initialization file were agreed on and implemented on short notice to be considered for processing the validation master set, level 1b

### 3. Achievements

- ☞ All achievements are in the UV - the IR still has to come
  - ✓ Optimize Etalon correction factor for all Reticon channels
  - Fix the SMR / reflectivity offset problem
    - We identified the origin of the problem, and principally know how to fix it. Implementation method is currently being evaluated.
  - ✓ Improve spectral calibration (increase number of lines, used for fit)
  - Fix problems in retrieving atmospheric polarisation values
    - Largely improved, however at one place in the algorithm we have to incorporate a recommendation, which was given at the verification meeting (see presentation by G. Lichtenberg).
  - ✓ Fix problems with the application of the polarisation correction factor
  - ✓ Observation geometry to be correctly provided for TOA

## 4. Configuration aspects

### (a) Versions used for the validation master-set (1)

- We started to process the data in parallel to the verification workshop with version 4.02b. At this moment, this was an internal version number, only. I.e. it was not officially delivered to the ground-segment (to gain time)
  - July/August 14<sup>th</sup> 2002 data was processed with this version.
- Shortly after the meeting, the version was operationally delivered
  - It became version 5.00
- Another patch had to be delivered (regarding the processor capabilities with respect to re-processing - no changes regarding science content)
  - It became version 5.01

## 4. Configuration aspects

### (a) Versions used for the validation master-set (2)

- Important message:
  - there is no principle difference between all these versions.
  - However, data from August 15<sup>th</sup> to December (I.e. vs. 5.+) have considered initialization file recommendations from workshop.
  
- The impact on level 2 will be minor/almost not visible for validation master-set
  
- Consistent set of data will be provided in line with the reprocessed global mission.

## 4. Configuration aspects

### (b) Key data

- Both, validation master set and NRT processing use the same set of key-data.
- The set is characterized by
  - Nadir calibration parameters of vs. 2.4
    - Unsmoothed
  - Limb calibration parameters of vs. 3.0
    - Unsmoothed, with a "re-aligned" coordinate frame
    - Compared to previous versions, this contributed a lot to the polarisation improvements in limb.
- However, there is still room/need for improvements
  - Example: radiometric calibration
    - Diffuser BRDF
    - Absolute Radiance Response

## 4. Configuration aspects

(c) calibration auxiliary files

- For the validation master set, most recent in-flight calibration parameters had to be retrieved, first.
- These have been considered, when processing the specified set of data.
- Regarding the actuality of in-flight auxiliary data, the validation master set therefore is "the best on the market".
- However ....

## 5. IECF

- Biggest problem (data supply from ground segment to IECF) now seems to be overcome.
- While we are here, we are working at the implementation of an automatic auxiliary file generation.
- Requires some final adjustments - but the principles are tested.
- Nice side effects
  - Systematically updated auxfiles, especially important for solar reference, dark current.
  - One dark current aux. File per orbit.
  - For NRT, turnaround of about 2 days seems realistic.
  - Not an issue for consolidated level 1b processing.

## 6. Remaining Challenges

- Optimize 1b with respect to infrared channels
  - Orbit wise dark current
  - Non linearity
  - Pixel to pixel
  - Wavelength calibration
- Further improvements regarding the absolute radiometric calibration / reflectivity offsets can be expected.
- Some final improvements regarding determination of atmospheric polarisation (recommendations from verification workshop) are going to be implemented.

## 7. Acknowledgements

- All this was a team effort
- Thank you for
  - Calibration support from the STT
  - especially to IFE, SRON
  - Verification team, which did a lot more work than what could be shown in this short presentation (and especially because they could do all this in very short time)
  - DLR-Bonn for tracking the MPM (master-plan-monster)