Minutes of Meeting

Meeting #4 of MIPAS Quality Working Group
19-20 July 2004
ESA HQ-Paris

LEVEL 2

- R. Mantovani (ESA) describes the Level 2 IPF configuration. The only update is the restoration of the old NESR thresholds in PS2 files.
- R. Mantovani (ESA) describes the instrument and product monitoring for level 0, 1 and 2. Some inputs from ASTRIUM and BOMEM are still necessary for the definition of level 0 and 1 monitoring, while the definition of level 2 monitoring is completed. She describes the QUADAS software that has been delivered in July 2004. QUADAS software does not include the level 2 monitoring, so it is asked to QWG to continue the level 2 monitoring activities.

S. Bartha (ASTRIUM) asks if there is the possibility to check the level 0 calibration using BEAT or QUADAS software

A.I. - 01 (QWG-M04) – ESA to check in which QUADAS/BEAT layer the level 0 calibration is performed.

- R. Mantovani (ESA) makes an overview of the current product anomalies.

A.I. - 02 (QWG-M04) – UO and UL to check new IPF 4.62 products.

- S. Bartha (ASTRIUM) briefly describes the status of the activities regarding the reduced resolution mode for ML2PP.

- S. Ceccherini (IFAC) describes the activities for operations at reduced spectral resolution of ORM. He describes the updates of ORM pre-processor, the first ORM run with the new MIPAS resolution and the comparison between results of ORM with new and old resolution. He concludes that the technical feasibility of the operation at reduced spectral resolution is confirmed and that no significant quality degradation is observed, but the computing time for each retrieval iteration is approximately double with respect to that necessary with the original MIPAS spectral resolution. For PT retrieval the chi-square obtained with the new resolution is comparable with that obtained with the old resolution, while for H2O the chi-square obtained with the new resolution is about 3.3 times larger than that obtained with the old resolution. This implies that further work on the selection of microwindows for H2O retrieval is necessary.

Rob Koopman (ESA) asks to IFAC to change the flag in PS2 file spec_events_flag from “B” (dec 66) to “N” (dec 78).

- A. Dudhia (OU) makes a presentation on microwindow selection for 0.0625 cm^{-1} sampling. For every target species he shows the reduction of the error and the growth of information associated with the addition of further microwindows. He remarks that the retrieval accuracy is expected to be similar to that obtained at the original MIPAS resolution, although probably worse at 6 km. Finally he lists some open questions, and in particular which species have to be processed in near real time.

R. Koopman (ESA) says that all the target species cannot be processed in near real time.

J. Remedios (UL) says that some people like Dominique Fonteyn do data assimilation and use also CH4 and N2O.
B. Carli (IFAC) reminds that the near real time products are provided within 3 hours from the measurement, people for which is acceptable to have the data within a week from the measurement can use the off-line products.
H. Fischer (IMK) says that probably in near real time it is sufficient to provide pressure, temperature and O3.
B. Carli (IFAC) notes that probably to retrieve O3 it is necessary also to retrieve also H2O.
A. Dudhia (OU) says that it is possible to retrieve only p, T and O3 without to retrieve all the chain including H2O.

- B. Carli (IFAC) describes the work plan for the operations at reduced spectral resolution. He notes that from the tests performed so far it seems that the in increase of computing time will be about a factor 4, while initially it was expected to be a factor 6. So he asks to ESA if it is possible to face an increase of factor 4 in computing time for near real time. In negative case it is necessary to find a way to reduce the computing time. He proposes to reduce the retrieved species to pressure, temperature, H2O and O3, this should bring a reduction of a factor 2 in computing time, so it is necessary to find another factor 2 of reduction. He proposes to analyse one orbit every two measured orbits, this would bring a reduction of resolution in longitude that is less important than the resolution in latitude.
  B. Carli (IFAC) proposes the test of different measurement scenarios: i) the original nominal scenario (3 km step) ii) 2 km step, iii) 1.5 km step iv) 1 km step.

H. Fischer (IMK) excludes that 1 km step scenario is useful. Then he proposes to perform two measurements for each altitude in order to solve the problem of forward/reverse oscillations.
B. Carli (IFAC) says that instead of performing two measurements for each altitude it is better to reduce the altitude resolution of a factor 2 (from 3 to 1.5 km step) and to apply a regularization.
M. Ridolfi (UB) notes that the horizontal resolution of ORM is about 3000 km, while MIPAS will measure a scan every 250 km, so he proposes to process one scan every two measured scans, instead of one orbit every 2 measured orbits.
H. Fischer (IMK) is in agreement with the proposal of M. Ridolfi (UB). Then he proposes to use more time to measure the upper atmosphere.

A.I. - 03 (QWG-M04) – IAA to provide a scenario for the measurement of the upper atmosphere for tests in August/September 2004.

A.I. - 04 (QWG-M04) – ESA to consider to perform two measurements for each altitude (forward and reverse) for tests in August /September 2004.

A. Kleinert (IMK) asks if the increase in computing time is only in level 2 or if it affects also the level 1.

A.I. - 05 (QWG-M04) – BOMEM to investigate if the change of spectral resolution implies an increase in level 1 computing time.

- J. Remedios (UL) discusses the necessity to update the concentration of CO2. Currently the processor is using the estimation of CO2 concentration of 2000.

R. Koopman (ESA) says that because the CO2 concentration is changing during the lifetime of MIPAS for the reprocessing it is necessary to use the appropriate CO2 concentration related to the considered year.
A. Dudhia (OU) says that an uncertainty of 1% in CO2 concentration is acceptable.

B. Carli (IFAC) proposes to perform an update of CO2 concentration every two years and to use an estimate of CO2 concentration extrapolated to one year after the date of the update.

A.I. - 06 (QWG-M04) – UL to provide updated CO2 climatology before of QWG meeting #5.

- A. Waterfall (UL) describes the temperature updates for the IG2 database then she notes that v4.61 reprocessed data still contain a few potentially cloudy points. Since cloudy points can have anomalous retrieved values they should be removed.

- M. Ridolfi (UB) makes a presentation on the platform-dependent optimisations in ORM_ABC. He describes some optimisations that lead to 40-50% computing time savings, depending on the architecture of the used platform. He has sent the details of the optimisations to ASTRIUM.

R. Koopman (ESA) asks to ASTRIUM to contact DJO to discuss the optimisations.

- M- Koukouli (IAA) makes a presentation entitled "Problems while retrieving water vapour even with a non-LTE radiative transfer model". The main aim of the study is to evaluate quantitatively the non-LTE effects on H2O retrievals. She concludes asking the reprocessing of orbits 1748-1752 (July 2nd, 2002), because they have co-locations with four other experiments, and at least one full day of orbits every three months in order to obtain seasonal variability in the upper atmosphere.

B. Carli (IFAC) comments the possible relation between the problems described by M. Koukouli (IAA) and the problems of H2O retrieval at high altitudes described by S. Ceccherini (IFAC) during QWG meeting #3.

- M. L. Puertas (IAA) makes a presentation on the analysis of upper atmosphere data. He describes the new vibrational temperature for NO2 and the quality of IPF 4.61 L1b spectra. He remarks that L1b data of orbits 1748-1752 are not consistent for different channels and asks for a reprocessing of them.

- C. Belotti (IFAC) describes the tests performed in order to clarify the anomalies reported at QWG meeting #3. He concludes that the original thresholds for the NESR have to be restored (A.I. 07 QWG-03 closed) and that the oscillations observed in CH4 and N2O profiles were induced by the problem of calibration for forward and reverse sweeps. The correction performed after orbit #8762 reduced the oscillations below the random error (A.I. 09 QWG-03 closed).

- P. Snoeij (ESA) makes a summary of the results of ACVE-2. In particular he reminds the request to retrieve NO2 for altitude lower than 24 km. Since it can be retrieved only during night-time it would be necessary to have two sets of auxiliary data and to switch from one to the other within an orbit.

B. Carli (IFAC) reminds that another recommendation reported at ACVE-2 was to use ECMWF data in order to establish the pressure at one altitude, instead to put the lower tangent altitude at the engineering value.

R. Koopman (ESA) says that it would be better not to use the lower tangent altitude to establish the vertical grid, because it is affected by the largest error due to the refraction index.

H. Fischer (IMK) suggests to use 15 km.

A.I. - 07 (QWG-M04) – IFAC to assess which is the best way to assign the altitudes to the retrieved profiles. To consider also ECMWF data as a possible alternative.

- R. Koopman (ESA) describes the reprocessing status and makes a list of the next conferences where the activities of QWG should be presented. He proposes to collect all the publications related to MIPAS in the IFAC web page.

A.I. - 08 (QWG-M04) – IFAC to set up an web page where to collect all the publications related to MIPAS (published after the launch).

A.I. - 09 (QWG-M04) – All to upload papers on MIPAS (in pdf format), published after the launch, to the Uranus server.

A.I. - 10 (QWG-M04) – ESA to send level 1 disclaimer to BOMEM and level 2 to IFAC.

A.I. - 11 (QWG-M04) – BOMEM to comment the disclaimer.

A.I. - 12 (QWG-M04) – IFAC to comment the disclaimer.

The QWG meeting #5 will be held on 4-5 October 2004 in ESRIN (instead of the original location of Florence).
The QWG meeting #6 will be held on 13-14 January 2005 at IFAC (Florence).

End of the meeting