Minutes of Meeting

Meeting #3 of MIPAS Quality Working Group
29-30 March 2004
ESA-ESRIN

LEVEL 2

- R. Mantovani (ESA) describes the Level 2 IPF status and configuration and proposes a set of product quality and processing performance indicators for the Level 2 monitoring.

A.I. - 01 (QWG-M03) – All to provide comments on the draft of the document describing the monitoring parameters (distributed by R. Mantovani on 23rd March 2004) before of 17th April 2004.

S. Bartha (ASTRIUM) asks if for the other ENVISAT instruments some quality indicators have already been defined.
R. Koopman (ESA) answers that a document on the monitoring parameters for GOMOS Level 1 has already been prepared.

A.I. - 02 (QWG-M03) – ESA to provide the document on the monitoring parameters for GOMOS.

M. Ridolfi (UB) notes that helpful inputs for the monitoring activity can be found also at the webpage of OU.

- S. Bartha (ASTRIUM) describes the MIPAS L2 processor prototype status. In particular he describes an algorithm weakness in case of extreme altitude corrections, that can produce a S/W crash. This issue is open until next IPF upgrade. ORM is able to detect the situations when this bug occurs.

- R. Mantovani (ESA) makes an overview of current product anomalies. These consist in: cloud detection not working when a slice of orbit is processed, an anomalous behaviour of the noise in channel D1, an excessive processing time for Level 2 off-line processing and a bug in ILS retrieval.

- J.-M. Flaud (LPPM) makes a presentation on spectroscopic data, in which he discusses the line positions, line intensities and broadening coefficients for Nitric Acid. He has looked at several bands which so far are not important for the retrieval of HNO3, but are important for the retrieval of other species like freons.

B. Carli (IFAC) asks if an update of the spectroscopic database should be done, taking into account that the update of the spectroscopic database implies a long chain of actions.
M. Carlotti (UB) proposes to perform a line by line calculation in order to estimate if the corrections proposed by J.-M. Flaud are useful.
R. Koopman (ESA) asks how long an update of the spectroscopic database takes.
B. Carli (IFAC) answers that in the worse case (when also the MWs have to be changed) it takes about one month. So he proposes to consider the updates for internal knowledge in QWG but to wait for more significant changes before a new release of the spectroscopic database is made.

- A. Dudhia (OU) makes a presentation on the Oxford activities regarding the Level 2 algorithm performance assessment. He has investigated the ghost spectra at ± 13.5 cm^{-1} due to pointing jitter suggested by IMK during QWG meeting #2, but he has not found any evidence of these ghost spectra in the near real time residuals.

M. Birk (DLR) asks to A. Dudhia if he knows the sensibility of his analysis to the pointing jitter.

A. Dudhia (OU) answers no.

M. Birk (DLR) proposes to model the ghost spectra due to the pointing jitter in a way that OU can estimate the sensibility of the analysis to the pointing jitter.

A. Dudhia (OU) describes an anomalous jump of about + 500 m in engineering heights above 30 km in February.

A.I. - 03 (QWG-M03) – ESA to investigate the anomalous jump in engineering heights above 30 km in February detected by OU.

A. Dudhia (OU) describes an increase in retrieved temperature of 2 K from 27-29 February, matched by a 10% decrease in CH4, H2O, N2O and NO2.

A.I. - 04 (QWG-M03) – ESA and OU to study the correlation of the increase in retrieved temperature of 2 K from 27-29 February with the calibration updates.

A. Dudhia (OU) describes a general upward trend in CH4 and N2O (B band), but not in H2O or NO2 (C band) since 8 February.

A.I. - 05 (QWG-M03) – ESA and OU to study the correlation of the general upward trend in CH4 and in N2O (B band) with the calibration updates.

A. Dudhia (OU) describes the comparison between Level 2 off-line and Level 2 near real time time. He has found a difference of 1 second in profile times between L2 OFL and NRT data.

A.I. - 06 (QWG-M03) – ESA to investigate the difference of 1 second in profile times between L2 OFL and NRT data detected by OU.

A. Dudhia (OU) says that NRT L2 products seem more robust than OFL L2 products in term of number of successful profiles.

S. Bartha (ASTRIUM) explains that this is due to the fact that OFL retrievals use more stringent convergence criteria, so it is natural to expect a smaller number of converged retrievals.

A. Dudhia (OU) concludes saying that the difference between NRT and OFL L2 data is in general not negligible, the OFL L2 data have problems at 60 km, the bottom levels for CH4 show an improvement in OFL L2 data and N2O has high 75N night-time mean profile in both L2 data.

- V. Payne (OU) describes an analysis of MIPAS NRT L2 data since July 2002. She shows the comparison of MIPAS data with some climatological profiles. At the end she asks for suggestions regarding the climatological profiles to use for the comparison.

H. Oelhaf (IMK) suggests to compare NO2 retrieved profiles with a 3D model prediction.

R. Koopman (ESA) suggests to monitor the quantity 2*CH4+H2O.

- A. Waterfall (UL) makes a presentation on cloud detection and reference atmospheres. She shows how generally the reference atmosphere profiles and the IG2 profiles are in good agreement with the retrieved MIPAS data, except for the temperature profiles at the poles that need to be updated. Potential differences, particularly in the poles, (eg. HNO3, N2O) will be investigated and CO2 concentration needs to be updated to take into account atmospheric trends.

She reports the percentage of L1b profiles flagged as having at least one significantly cloudy level between 12 and 40 km. This percentage is in agreement with expected results from CRISTA data, however further work is required to assess the optimum threshold limits.

- M. Ridolfi (UB) makes a presentation on horizontal inhomogeneities. He shows that the differences between ORM and GEOFIT retrievals are not correlated with horizontal gradients in the atmosphere, and that several differences between GEOFIT and ORM implementation (as different retrieval grids, different refraction treatment, different FOV treatment and different earth's shape treatment) may dominate the results. Before drawing the final conclusions on this issue GEOFIT has to be validated. The validation of GEOFIT is ongoing by UB independently by the QWG activities, and it is estimated that it will be completed in September 2004. If a conclusion on the errors induced by the horizontal inhomogeneities on ORM retrievals is urgently requested UB proposes an alternative strategy, that is the comparison of ORM or PDS products (limited to temperature and ozone) with ECMWF data and the correlation of the discrepancies with horizontal gradients.

R. Koopman (ESA) says that we can wait for the validation of GEOFIT to be completed in September 2004. If a delay in the validation of GEOFIT will occur then we can use the alternative strategy proposed by UB.

- B. Carli (IFAC) makes a review of the action items from the previous QWG meeting, he describes the new ADF2 delivered in February 2004, pointing out the change in the NESR threshold. If NESR is back to its original values the previous NESR threshold should be restored. However, the actual functionality of the NESR threshold was never verified.

A.I. - 07 (QWG-M03) – IFAC to test if the previous NESR threshold settings are correct for the more recent L1b files.

B. Carli (IFAC) makes some considerations on the possibility of ORM code to handle measurements with spectral resolution reduced of 5%, and concludes that some test measurements will be made to verify that several weeks measurements at lower resolution can be processed without any change to code and settings.

R. Koopman (ESA) says that the orbits 10812 - 10815 acquired on 25th March 2004 are at 95% of full resolution and that there will be low probability to have a few weeks of measurements with this resolution.

- S. Ceccherini (IFAC) describes a problem in the H2O retrieval at 68 km altitude due to the presence of some strong saturated H2O lines, that could produce more than one minimum in the chi-square function. In this case which minimum the retrieval selects depends on the initial guess.

A.I. - 08 (QWG-M03) – IFAC and OU to continue to investigate on the problem connected to retrieval of H2O at high altitude.

S. Ceccherini (IFAC) shows that the oscillations observed in CH4 and N2O profiles are not induced by oscillations in temperature profiles, but are intrinsic of these retrievals. Because CH4 and N2O retrievals use mws in band B it is possible that the oscillations in the profiles are due to the problem of calibration for forward and reverse sweeps in band B.

G. Perron (BOMEM) points out that forward/reverse differences should have been corrected after orbit #8762.

A.I. - 09 (QWG-M03) – IFAC, BOMEM, IMK and DLR to investigate if the oscillations in CH4 and N2O profiles can be induced by the problem of calibration for forward and reverse sweeps in band B.

S. Ceccherini (IFAC) shows some tests performed in order to estimate the possibility to run ORM on special modes S1 and S2. He shows that ORM with handmade occupation matrices runs on special modes S1 and S2, but in some cases high values of chi-square have been observed. He shows that in orbit #6675 (special mode S1) the high values of chi-square are correlated with high values of frequency shift and is not, therefore, a special mode issue.

A.I. - 10 (QWG-M03) – UB to send Level 1b file of orbit #6675 to BOMEM.

A.I. - 11 (QWG-M03) – BOMEM to investigate on high values of frequency shift on orbit #6675 detected by IFAC.

S. Ceccherini (IFAC) shows the comparison for some scans of orbit #6689 (special mode S2) and some independent correlative data found in the NILU database for CALVAL.
J. Langen (ESA) says that it is necessary to perform more tests to evaluate if ORM works on special modes (especially on special mode S1 for which 6 months of measurements are planned), besides it is necessary to understand if the measurements on special modes can bring more information with respect to the measurements on nominal mode. In particular if the measurements with a smaller vertical step produce an increase in the vertical resolution of the retrieved profiles.

• H. Oelhaf (IMK) also makes a presentation on special observation modes. He describes the characteristics of the special modes and which orbits are measured in special modes. He shows the results of some tests on S2 special modes measurements done at IMK. He shows a list of learnt lessons from the special mode S2 processing and concludes with some open issues and suggestions concerning the decision that have to be taken on how to proceed with special modes.

• B. Funke (IAA) makes a presentation on the analysis of upper atmosphere data performed at IAA. In the analysis of the special mode UA1 he points out some problems: large zig-zaging radiance at high altitudes, large offset variation with wavenumber tangent altitude and time, discontinuities in H_2O retrievals at high altitudes. In June 2003 some scans with null NESR have been detected.

A.I. - 12 (QWG-M03) – ESA to look for Level 0 files corresponding to scans with null NESR and to investigate.

B. Funke (IAA) shows the results of the analysis of special mode UA4 and describes some implications of NLTE for nominal measurements. He concludes with some suggestions for future UA's mode measurements.

• M. Ridolfi (UB) makes a presentation on the definition of Level 2 configuration and algorithm updates. For every issue he describes the action to be done, the modification of the algorithm (if necessary), the modification of the auxiliary data (if necessary) and the ESL subgroup involved in the issue.
S. Bartha (ASTRIUM) recommends that the optimizations in computing time adopted by UB are considered also for the operational code.

A.I. - 13 (QWG-M03) – UB to communicate to ASTRIUM the optimizations in computing time adopted by UB.

A.I. - 14 (QWG-M03) – IFAC to define the justifications, the priorities, the benefits and the resources for every item in the definition of Level 2 configuration and algorithm updates.

• B. Carli (IFAC) makes a presentation on the finalization of Level 2 workplan and schedule, describing in particular the plan for the second year of activities.

Concerning the conference calendar, ESA is planning a common format for the presentations of ENVISAT instruments. Abstract on MIPAS instrument should wait for this decision.

A.I. - 15 (QWG-M03) – ESA to inform QWG about ESA plans for the presentations of ENVISAT instruments.

R. Koopman (ESA) says that the meeting # 4 of QWG will be held in Paris at the end of July.

A.I. - 16 (QWG-M03) – B. Carli (IFAC) to inform R. Koopman (ESA) about the days in which presentations are made at COSPAR about MIPAS.

A.I. - 17 (QWG-M03) – R. Koopman (ESA) to define final dates for QWG meeting #4 in the week of COSPAR meeting

R. Koopman (ESA) says that the meeting #5 of QWG will be held in Florence on the 4th and 5th of October.

End of the meeting