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Meeting place lieu de la réunion	Karlsruhe, IMK	Chairman Secretary	C. Zehner C. Zehner
minute's date dates de minute	07 December 2005	participants participants	Enclosed Listing
subject/objet	3rd MIPAS Science Team Meeting	copy/copie	G. Kohlhammer, S. Briggs, H. Laur, M. Doherty, E. Herland, YL. Desnos

description/description	action/action	due date/date limite
ACTIONS		
AI9ST2 ESA to include a listing onto the Uranus ftp server providing an overview of re/processed MIPAS Level 1 and Level 2 data including the version number of the processing software being used.	ESA	asap
AI12ST2 MIPAS Science Team to provide MIPAS PR images to C. Zehner (onto ftp server - to be used for the ESA Envisat Webpage-Gallery on MIPAS promotion).	MST	asap
AI1 to H. Oelhaf to send a problem report to cohelpe@esa.int and to T. Fehr to investigate why two different data sets are being provided and what is the reason for the difference seen in these data	IMK, ESA	asap
AI2 to T. Fehr to check the feasibility to implement a floating data gap during nominal mode operations.	ESA	asap
AI3 to T. Fehr to check the available quality flags in the MIPAS L1 and L2 and report this back to IMK.	ESA	asap
AI4 to T. Fehr to check the feasibility to perform AE measurements over 1 full orbit.	ESA	asap
AI5 to T. Fehr to check the feasibility to perform again S6 special mode measurements (with further reduced spectral resolution).	ESA	asap
AI6 to the MIPAS Science Team to define in detail the Diurnal Change Mode settings.	MST	end 2005
AI7 to H. Oelhaf to include twice Dynamics Mode measurements (alternating with Nominal Mode Measurements) into the MIPAS Mission planning for 2006.	IMK	early 2006
AI8 to C. Zehner to provide more detailed information on the SAUNA campaign to the MIPAS Science Team	ESA	asap
AI9 to H. Oelhaf to provide the MIPAS mission planning to M. Laurentis for the first 4 months of 2006.	ESA	asap

1. Welcome and Introduction

H. Fischer welcomes all participants at IMK Karlsruhe, where the 3rd MIPAS Science Team Meeting is taking place.

2. Action Items Status of last Meetings

Zehner (ESA)

All Action Items (see Annex A) of the previous meetings have been closed except: **AI9ST2** – changed to : ESA to include a overview listing onto the Uranus ftp server providing an overview of re/processed MIPAS Level 1 and Level 2 data including the version number of the processing software being used. **AI12ST2** MIPAS Science Team to provide PR images to C. Zehner (onto ftp server - to be used for the ESA Envisat Webpage-Gallery on MIPAS promotion).

3. MIPAS Instrument Status

Fehr (ESA)

In general the MIPAS instrument operations with only 41% resolution in order to minimize the risk for the so called Launch Lock failures has been working quite well. After a very high IDU error occurrence this summer/autumn it seems that the number of IDU errors is decreasing again and the continuation of MIPAS operations is feasible. Detailed analysis on the IDU errors showed that the highest error rate correlate with a specific orbital location. Investigations are still ongoing to try to understand this.

4. MIPAS Operations/Data Processing Status

Fehr (ESA)

Since the planned MIPAS mission interruption during 26 Aug. to 26 Sep. two campaigns (Southern France and SCOUT – until Dec. 16) are being supported by the current MIPAS operations.

About 20 orbits of Level 1 products (out of all measurements performed since mid 2004) have been processed by ESA so far and provided via ftp server to the MIPAS Science Team for investigation.

The reprocessing of all Level 1 and Level 2 full resolution measurements (06/2002 - 03/2004) with software version 4.62 has been completed and all data are available via ftp server to the user community.

The reprocessing of all (Level 1 and Level 2) low resolution measurements with software version 4.65 will start during Dec 2005 and the data will be made available to user community via ftp server. **The MIPAS Science Team recommends to perform re/processing of the Noctilucent Cloud measurements performed during this summer with highest priority. Second priority on re/processing have all validation campaign measurements and third priority have UTLS-1 measurements.**

H. Oelhaf reports that for 11 Sep. 2002 MIPAS Level 2 data processed with different software version numbers are provided to the users by ESA showing differences of 3 K in temperature at low height

that might be caused by the usage of different a priori information. **AI1** to H. Oelhaf to send a problem report to eohelpde@esa.int and to T. Fehr to investigate why two different data sets are being provided and what is the reason for the difference seen in these data.

IMK requests that bad MIPAS data should be flagged. **AI2** to T. Fehr to check the available quality flags in the MIPAS L1 and L2 data and to report this back to IMK.

5. Review of new MIPAS Modes/Measurements

The settings of all new MIPAS operational modes are fine except for the Aircraft Emission mode, which are currently investigated by ESA (altitude setting/registration). In order to have global coverage after 3 days of nominal mode measurements the MIPAS Science Team would like to have a floating data gap instead of a fixed one being implemented. **AI3** to T. Fehr to check the feasibility to implement a floating data gap during nominal mode operations. The analysis of Aircraft Emission measurements would be much easier if they could be performed over one full orbit. **AI4** to T. Fehr to check the feasibility to perform AE measurements over 1 full orbit.

Based on a presentation of M. Carlotti horizontal oversampling in different modes was discussed and as a matter of fact the real horizontal resolution for different modes is not really known. Specific tests would be necessary to find this out and to apply a best regularisation scheme in the data processing. Additional S6 mode measurements might be useful to gain more insight on this. **AI5** to T. Fehr to check the feasibility to perform again S6 special mode measurements (with further reduced spectral resolution).

The following 2 additional new modes are being proposed (both to be measured only twice alternating with nominal mode measurements in order to perform specific measurements to get more insight into future instrument/mission requirements for Earth-Explorer missions):

- Diurnal Change Mode: the instrument looking sideward while crossing the terminator
- Dynamics Mode: already been specified

AI6: The MIPAS Science Team to define in detail the Diurnal Change Mode settings. **AI7:** H. Oelhaf to include twice Dynamics Mode measurements (alternating with Nominal Mode Measurements) into the MIPAS Mission planning for 2006.

A. Dudhia presented that several MIPAS orbits have been processed by University Oxford up to Level 2 products in order to perform intercomparison/validation with first data available from the EOS-AURA mission:

- Intercomparison to HIRDLS measurements show that MIPAS data agree better to climatologically data than HIRDLS data
- Intercomparison to TES measurements show high differences in temperature (up to 15 K) and good agreement on ozone
- Intercomparison to MLS (mature instrument, which was operational after 1 month after satellite launch) show good agreement on CO, a 3K bias (higher) in MLS temperature as compared to MIPAS, very good agreement for H2O above 20 km, good agreement on

Ozone, and that HNO₃ MLS data are 20% higher than MIPAS data (most probably caused by spectroscopy)

A. Waterfall reported that ECMWF has started to try to assimilate directly MIPAS Level 1 data into their data assimilation system. First results are encouraging but certain biases in the ECMWF system have still to be adjusted by using MIPAS Level 2 products as reference.

The reported unusual increase of the gain function of 7% early this year as well as the possible sensitivity of the ORM to unusual high NO₂ values will be further investigated by the MIPAS Quality Working Group.

6. Future Mission Planning

MIPAS Short-Term Operational Scenario:

Time 2005	Mode	Operational Scenario	Objective
until December 16	Nominal, UTLS-1	~4 orbits per day	Support to SCOUT campaign
22-24 December	Nominal including AE	1 day AE	Aircraft Emission
29-31 December	MA UA	2 days 1 day	Monitor Upper Atmosphere

MIPAS Operational Scenario Priorities for 2006:

Following campaigns should be supported:

- ACVT Kiruna campaigns during Jan., Feb., and Mar.
- SAUNA campaign Mar. 27 – Apr. 2006 – **AI8**: C. Zehner to provide more detailed information on this campaign to the MIPAS Science Team
- AMMA campaign during summer over Africa

AE mode measurements shall be performed at least once per season. Otherwise the long term operational scenario shall be followed as it has been defined during the last 2 MIPAS Science Team Meetings.

AI9: H. Oelhaf to provide MIPAS mission planning to M. Laurentis for the first 4 months of 2006 including the two new modes (see chapter 5).

7. Priorities on Future MIPAS Data Exploitation

T. von Clarmann presented his view on priorities on further future Exploitation of the unique MIPAS data set measured in high spectral resolution:

- Solar Impact
- Subsidence from Mesosphere into the Stratosphere
- Chemistry of HOx (e.g. HOCL)
- Heterogeneous Chemistry
- Polar Stratospheric Clouds
- Age of Air (SF6)
- Tropopause
- Tropospheric Pollution (transport into upper atmosphere)

8. Any Other Business

Preparation of scientific MIPAS Validation Publication(s): A Special Issue on MIPAS Validation results for the ACP is being prepared under the lead H. Fischer including following single papers on:

- MIPAS Overview
- Level 1 Product
- Level 2 Product
- Error/Microwindows
- LOS Validation
- Climatology used
- 6 papers on validation of p, T, O3, H2O, CH4, NO2, and Pointing

A first draft of the Special Issues is expected by Feb. 2006.

Planned ACVE Meeting: The MIPAS Science Team would prefer to have this meeting during autumn 2006 to enable validation of the new MIPAS low resolution measurements.

Next MIPAS Science Team Meeting: is planned during EGU at Vienna – April 3-7 2006.

Agenda:

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|-------------|--|
| 09.00-09.20 | MIPAS Instrument Status and Overview of new instrument operations/ESA data processing performed so far (T. Fehr) |
| 09.20-09.45 | Status/Review of AIs from the last Meetings (C. Zehner) |
| 09.45-10.15 | Review of New Nominal Mode Measurements/Settings – first Retrieval Results (All) |
| 10.15-10.45 | Coffee Break |
| 10.45-12.30 | Detailed Review of New Special Modes Measurements/Settings – first Retrieval Results (e.g. NO2 signal in Air Craft Emission Mode?) (All) <ul style="list-style-type: none"> • Problem of horizontal oversampling in the new observation modes (M. Carlotti) |
| 12.30-13.30 | Lunch Break |
| 13.30-14.30 | Review of new MIPAS (as performed so far) Operations Scenario – Definition of future Operations Scenario (including campaigns e.g. SAUNA campaign March 27 to April 14 2006) (All) |
| 14.30-15.00 | Update on status of assimilation trials for T, O3 & H2O by ECMWF of MIPAS L1 & L2 data/Utilisation of MIPAS L1 & L2 data by HIRDLS (A. Waterfall replacing B. Kerridge) |
| 15.00-15.30 | Priorities on future scientific MIPAS data exploitation (with emphasis on the 2.5 years of MIPAS operations in high spectral resolution mode) <ul style="list-style-type: none"> • IMK Ideas (T. Clarmann - 10 minutes) |
| 15.30-16.00 | AOB <ul style="list-style-type: none"> – MIPAS validation paper – Atmospheric Science Conference (ESRIN May 2006) |

List of Participants:

Carlotti, Massimo	Universita Degli Studi di Bologna, Dip. di Chimica Fisica ed Inorganica
Dudhia, Anu	Oxford University, Atmospheric Oceanic & Planetary Physics Clarendon Laboratory
Fischer Herbert; Oelhaf Herman; von ClarmannThomas, Stiller Gabi	Institut für Meteorologie und Klimaforschung, Forschungszentrum Karlsruhe
Flaud, Jean-Marie López-Puertas, Manuel Waterfall, A. Fehr, Thorsten	LISA CNRS/Univ Paris Instituto de Astrofísica de Andalucía Rutherford Appleton Laboratory ESA

Annex A:

Action Item		Status
AI1 to ESA to perform the Level 1 processing of these data again with optimised calibration parameters.	ESA	done (8 orbits)
AI2 to ESA to assess the feasibility to change the MIPAS mission planning to include new floating height pattern for nominal mode measurements. To UO to verify that the altitude range of the MW is consistent with the floating altitude implementation. To IFAC to verify that the initial guess determination is consistent with the floating altitude implementation. To ESA to verify that the floating altitude increment is applied only at the beginning of each limb scan sequence.	ESA, IFAC, Univ. Oxford	done – formula has been updated, new test measurements have been performed and provided to the Science Team for review
AI3 to Univ. Oxford to provide these new Microwindows to ESA/IFAC for implementation into the MIPAS data processor.	Univ. Oxford	done
AI4 to IAA to investigate in more details the NESR of the new MIPAS MA/UA measurements.	IAA	done – NESR values are ok
AI5 to M. de Laurentis to interact directly with IMK to optimise all calibration measurements for new planned MIPAS operations and to optimise the input parameters (e.g. latitude band of Northern Atlantic Flight Corridor) for the AE mode.	ESA/IMK	closed – AE mode will be activated in the sector latitude 30°-70° N and longitude 80° W- 20° E
AI6 to M. de Laurentis to check the feasibility to modify the MA mode to include two further layers at the heights 79.5 and 82.5 km.	ESA	closed – feasibility confirmed
AI7 to B. Kerridge to investigate ECMWF requirements for the inclusion of MIPAS measurements into their forecasting system (e.g. every 3 rd orbit/day)	RAL	closed – ECMWF would need MIPAS NRT data each day
AI8 to C. Zehner to investigate BIRA/IASB requirements for the inclusion of MIPAS measurements into their assimilation system BASCOE and to check the feasibility to resume MIPAS NRT processing at ESA.	ESA	closed – NRT data, based on current proposed MIPAS operations, would be useful (impact of data gaps would need to be assessed in detail), also off-line data would be useful for reanalyses but more species than the ESA core species would be needed
AI9 to ESA to provide clear information to the MIPAS users on the inventory of reprocessed MIPAS data (software versions used, data gaps)	ESA	Closed – all L1 and L2 data available on ftp server
AI10 to C. Zehner to check the data policy for redistribution of MIPAS L1 data via BDAC (which should be basically restricted to accepted AO projects having quotas for MIPAS L1 data).	ESA	closed – based on the ESA Data Policy data can only be redistributed to Co-PIs within the ESA AO/Cat-1 project under which these ESA data are received from

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		ESA
AI11 to ESA to perform asap the reprocessing of MIPAS validation data sets dated on 2002 and 2004.	ESA	closed
AI12 to C. Zehner to check feasibility to have the 3 rd meeting on Sep. 23 (to have it after the MIPAS QWG meeting and not before).	ESA	closed – date of Sep. 23 2005 is confirmed

Status of Action Items of the 2nd MIPAS Science Team Meeting

AI01 to H. Oelhaf to refine especially MIPAS campaign mode measurements – input to be directly provide to M. Laurentis	ESA	closed
AI12 to MIPAS Science Team to provide PR images to C. Zehner (to be used at the ESA Envisat Webpage-Gallery for MIPAS promotion)	ESA	open

Status of Action Items of the short MIPAS Science Team Meeting Sep. 2006 in Bologna