

# Discussion on MIPAS Validation Papers during EGU Meeting, 26 Apr. 2005

Purpose:

Validation of **operational** (ESA) MIPAS products: p, T,  
H<sub>2</sub>O, O<sub>3</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HNO<sub>3</sub>, NO<sub>2</sub>

Issues for discussion

- General items
- Structure of papers
- Involved scientists
- Schedule

# General Items (1)

## 1. Coincidence criteria

- General issues
  - Geophysical situation (atmospheric variability)
  - Measure for atm. Variability (e.g. from CTMs) ?
  - Species' photochemical lifetime
  - Type of correlative measurements (snapshot measurements vs. ground-based observations)
- Baseline (except for NO<sub>2</sub>): 300 km, 3 hrs

# General Items (1)

- Items of Discussion:
  - The baseline coincidence criteria are to be considered as guideline. In special cases (e.g. for NO<sub>2</sub>) they must be considered more stringent, in other cases they can be relaxed, in particular, if a large number of measurements is available and thus a statistical assessment can be performed
  - In polar winter the PV difference can be used also as a criterion
  - Trajectory calculations: In order to improve the number of coincidences trajectory calculations can be performed; the baseline coincidence criteria should be applied also in these cases..

# General Items (2)

## 2. Vertical resolution and coverage

- Different vertical resolutions of MIPAS measurements and correlative measurements need to be accounted for by using appropriate averaging kernels, e.g. for
  - Ground-based measurements
  - In-situ observations
- In case of g-b measurements the calculation of (partial) columns needs to be standardized

# General Items (2)

- Items of Discussion:
  - MIPAS averaging kernels are available for standard cases (dependent on target parameter, latitude, season...)
  - AI (IMK): Documentation and address of FTP site to be distributed

# General Items (3)

## 3. Ground-based (g-b) measurements

- Two methods for adapting vertical resolutions
  - Applying the g-b averaging kernels to MIPAS measurements
  - Forward calculation of g-b spectra with MIPAS profile and subsequent retrieval of total column or profiles with settings of g-b instruments
  - Do these methods produce the same results?
- Problem of calculation of partial or total columns
  - Pressure value of the lowermost available MIPAS point needs to be taken; **for determination of height use ECMWF data**
  - Truncation of g-b profile or completion of MIPAS profile ?
  - Only partial columns should be compared !

# General Items (4)

## 4. Comparisons

- Pressure coordinate to be used
- Coincidence quality to be indicated
- Indicate combined error bars

## 5. Data assimilation not to be included

# Structure of validation papers

Length: baseline 10 printed pages

- **Introduction**
  - Brief scientific role of the species
  - Validation campaigns
- **Brief Summary of MIPAS**
  - MIPAS measurements  
Data version (V4.61 is baseline, to be checked)
  - data processing (incl. spectroscopic data) and error budget
  - Internal data consistency checks (to be done)
- **Summary of validation experiments**
  - Sensor characteristics
  - Spectroscopic data base (for IR measurements MIPAS spectroscopic data base should be used)
  - Analysis methods and error budget (precision, accuracy)
- **Comparisons with correlative observations**
  - G-b (columns and profiles)
  - Balloon and AC Profile measurements
- **Satellite intercomparisons** (if adequate and available)
  - Systematic deviations?
- **Assessment and summary**
- **References**



# Structure of validation papers

## Discussion:

- MIPAS data version: AI (IMK): to be fixed after consultation of ESA
- MIPAS internal data consistency checks could be performed in atmospheric regions with low variability (AI to QWG)
- Error bars: Precision and accuracy values to be indicated for both MIPAS and correlative measurements. AI (IMK/ESA): Error budgets for MIPAS products to be distributed)
- Article structure: Section about validation approach to be added.

# References

- Fischer&Oelhaf, Appl. Optics, 1996  
(Fischer, H., and H. Oelhaf; Remote sensing of vertical profiles of atmospheric trace constituents with MIPAS limb-emission spectrometers, *Appl. Opt.*, 35, 16, 2787-2796, 1996.)
- MIPAS Science Report (ESA Publication)  
(Fischer, H., C. Blom, H. Oelhaf, B. Carli, M. Carlotti, L. Delbouille, D. Ehhalt, J.-M. Flaud, I. Isaksen, M. Lopez-Puertas, C.T. McElroy, and R. Zander, Envisat-MIPAS – An instrument for atmospheric chemistry and climate research, editors: C. Readings and R.A. Harris, *ESA Publication SP-1229*, European Space Agency, 2000.)
- MIPAS Overview paper (Fischer et al., in preparation)
- Level 1 paper (to be checked)
- Level 2 paper (Carli et al, in preparation)
- MIPAS Spectroscopy (Flaud et al.)

# MIPAS Validation Papers and involved scientists (suggested baseline)

- **Overview paper:** (should include general validation aspects, e.g. coincidence criteria) H. Fischer, B. Carli, H. Oelhaf, R. Koopman et al.
- **Level-1 and Level-2 papers ?**
- **p,T-paper:** B. Carli (tbc), C. Blom, K.H. Fricke, A. Dethof, T. v. Clarmann, M. Ridolfi, M. Kiefer, U. Blum, et al....
- **Ozone-paper:** U. Cortesi, T. Blumenstock, D. Fonteyn, B. Kerridge, H. Fischer, C. Vigouroux, C. Piccolo, H. Schets, S. Wood, J.C. Lambert, H. Sembhi et al.
- **H<sub>2</sub>O-paper:** H. Oelhaf, A. Fix, C. Schiller, G. Pappalardo, W. Lahoz, H. Fischer, M. Weber, V. Payne,, M. Milz, J. Remedios, S. Ceccherini et al.
- **CH<sub>4</sub> and N<sub>2</sub>O-paper:** C. Camy-Peyret (tbc), A. Engel, C. Blom, M. Pirre, A. Bracher, G. Wetzel, C. Vigouroux, P. Raspollini, J. Urban, G. Stiller, J. Remedios et al.
- **HNO<sub>3</sub>-paper:** H. Oelhaf (tbc), M. de Maziere, M. Pirre, K. Strong, H. Schlager, G. Wetzel, T. Blumenstock, C. Vigouroux, P Raspollini, M. Höpfner, et al.
- **NO<sub>2</sub>-paper:** G. Wetzel, F. Goutail, G. Stiller, B. Funke, A. Bracher, M. de Maziere, F. Hendrick, M. Rozendael, H. Oelhaf, J.C. Lambert, M. Lopez-Puertas et al.

# Schedule

- April 2005: Meeting in Vienna
- May 2005: lead authors and contributing scientists fixed
- Aug. 2005: Intercomparisons completed and results (incl. data ) sent to the lead author
- Sept. 2005: Meeting/splinter meetings of the author's teams in Karlsruhe

Suggested dates: (1) 29/30 September or  
(2) 13/14 October

- Nov. 2005 first paper versions completed
- 31.1.2006 Submission deadline