



Three dimensional measurements of target and non-target species with MIPAS/ENVISAT

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Introduction

The Michelson Interferometer for Passive Atmospheric Sounding, MIPAS, was launched on board of European Space Agency (ESA) environmental monitoring satellite, Envisat, in March 2002.

It is a Fourier transform spectrometer for the measurement of high-resolution emission spectra at the Earth's limb. In a single orbit it measures 70 profiles each at 17 levels that range from the upper troposphere to the lower mesosphere, acquiring good geographical coverage with 14 orbits per day.

Envisat Payload Data Segment performs the near-real-time (NRT) retrieval of profiles of pressure, temperature and volume mixing ratio of six target species (H_2O , O_3 , HNO_3 , CH_4 , N_2O and NO_2).

NRT Level-2 analysis is based on the scientific code called Optimised retrieval model (ORM [1]) developed by an international consortium in the framework of an ESA-supported study led by the Institute for Applied Physics "Nello Carrara" (IFAC).

Data products

ESA Level-2 products are being processed to obtain both isobaric and constant altitude concentration maps for the target species. Each map results from an interpolation of observations taken in three days using approximately 3000 measurement points.

Maps are available at the group's web site (<http://www.ifac.cnr.it/retrieval/>), for each species it is possible to find views of either the single hemispheres or of whole globe.

ORM code is also being used for off-line retrieval of non-target species as CFC-11, CFC-12, ClONO₂, N₂O₅ and CO. The retrievals are based on a microwindows approach that uses spectral intervals selected at University of Oxford [2].

In particular new results are shown on CO profile retrieval and on CO monthly concentration mean maps.

Conclusions

MIPAS time and spatial coverage of the Earth allows for a multi-dimensional view of a variety of atmospheric trace gases (both target and non-target species) that can be studied in their time evolution.

References

- [1] M. Ridolfi et al. "Optimized forward model and retrieval scheme for MIPAS near-real-time data processing", *Applied Optics*, 39, 1323-1340, 2000.
- [2] Dudhia, A., V. L. Jay and C. D. Rodgers "Microwindow Selection for High-Spectral-Resolution Sounders", *Applied Optics*, 41, 3665, 2002.