



## **Observing the mesosphere and lower thermosphere with MIPAS: Lessons learned and prospects for the future**

B. Funke and the IMK/IAA MIPAS/ENVISAT Team  
CSIC, IAA, Granada, Spain (bernd@iaa.es)

The Michelson Interferometer for Passive Atmospheric Sounding (MIPAS) observes atmospheric emissions in the mid-infrared (14.6 to 4.15  $\mu\text{m}$ ) with high spectral resolution (0.025 to 0.0625  $\text{cm}^{-1}$ ). It has been launched into a polar sun-synchronous orbit on 1 March 2002 and has been measuring, since then, 1000 to 1500 vertical scans through the atmosphere every day, from pole to pole during day and night. The measurements cover the altitude range from about 6 to 70 km in nominal observation mode, and up to 170 km in special observation modes. Operational data processing by ESA is limited to the assumption of local thermodynamic equilibrium (LTE) which holds only for a limited number of atmospheric emitters in a restricted altitude range. A dedicated non-LTE processing system has been developed and operated at IAA and IMK which allows for the retrieval of distributions of a large number of additional quantities beyond the operational data products relevant to chemistry, dynamics, and energetics of the mesosphere and lower thermosphere. In this talk, we give an overview on the scientific results obtained from this data set which include, among others, contributions to a better understanding of energetic particle precipitation effects and its dynamical modulation. Further, recent activities focussing on the retrieval of kinetic temperatures and nitric oxide densities in the thermosphere (110 - 160 km) will be summarized.