STRATOSPHERIC TEMPERATURE PROFILING FROM SPACE BY GOMOS ON ENVISAT WITH UNPRECEDENTED VERTICAL RESOLUTION

A. Hauchecorne (1), F. Dalaudier (1), J.L. Bertaux (1), C. Cot(1), B. Théodore (2), V. Sofieva (3)

(1) Service d’Aéronomie, CNRS, Verrières-le-Buisson, France, (2) ACRI, Sophia-Antipolis, France, (3) Finnish Meteorological Institute, Helsinki, Finland
(hauchecorne@aerov.jussieu.fr/Fax 331 69 20 29 99)

GOMOS was launched on board ENVISAT on March 1st, 2002. The main objective of this instrument is the global monitoring of stratospheric ozone. The measurement of the UV-visible spectrum of stars occulted by the atmosphere allow to determine the vertical profiles of ozone and other minor constituents. Star spectra exhibit scintillations due to small-scale refractive index structures in the atmosphere. Two fast photometers (1 kHz sampling rate), one in the blue and one in the red, allows for the correction of scintillations. Due to the chromatic variation of refractive index, refractive structures appear in the scintillation signal with a time delay between the red and the blue signal proportional to the bending angle of the star light in the atmosphere. From the bending angle it is possible to compute the density and temperature profiles between 15 and 35 km with a vertical resolution of about 200 m. To our knowledge, such a high vertical resolution has never been obtained from space. It will allow to perform a global analysis of gravity wave energy in the stratosphere. Results obtained during a few reference periods will be presented and compared to ECMWF profiles.