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Water vapour profiles and non-LTE parameters from its mesospheric emissions derived from MIPAS/Envisat.

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With the advent of high resolution and high sensitivity instruments mounted on satellite platforms, high sensitivity remote sensing of the atmosphere from limb measurements in the infrared region of the spectrum has become possible. MIPAS on board Envisat has three characteristics that make it very useful in studying the upper atmosphere from infrared emissions: its wide spectral coverage **(**4.15-14.6 μm**)**; high spectral resolution **(**0.05 cm^{-1}**)**, and its high sensitivity; all of this in addition to its near-global pole-to-pole and day and night spatial coverage.

Since in the upper atmospheric regions the excited molecular states which produce the observed infrared emissions depart from their Boltzmann populations, non-local thermodynamic equilibrium **(**non-LTE**)** radiative transfer models are required to explain the observations.

For the case of water vapour, over the years numerous studies have been performed trying to, first, deduce the water vapour concentration in the stratosphere and mesosphere and secondly, better our existing knowledge on the parameters that adequately describe its non-LTE emissions (Zaragoza et al., 1998, Mlynczak et al., 199 and Edwards et al., 2000**)**.

In this paper, we present joint retrievals of water vapour vertical profiles and non-LTE parameter and the efforts performed to better the uncertainties by which these parameters are defined.

Zaragoza et al., Evidences of non-LTE emission in the ISAMS water vapour channels, Advances in Space Research, Volume 22, Issue 11, 1998, Pages 1513-1516.

Mlynczak et al., Kinetic requirements for the measurement of mesospheric water vapor at 6.8 mu m under non-LTE conditions, Geophysical Research Letters, 26 (1): 63-66 JAN 1 1999

Edwards et al., Evidence of H2O nonlocal thermodynamic equilibrium emission near 6.4 mu m as measured by cryogenic infrared spectrometers and telescopes for the atmosphere (CRISTA 1), Journal of Geophysical Research-Atmospheres, 105 (D23): 29003-29021 DEC 16 2000