Geophysical Research Abstracts
Vol. 12, EGU2010-6457, 2010
EGU General Assembly 2010

SCIAMACHY Lunar Occultation Water Vapor Measurments For The Southern Hemispheric Stratosphere

Faiza Azam, Klaus Bramstedt, Alexei Rozanov, Heinrich Bovensmann, and John Burrows

Institute of Environmental Physics (IUP), University Of Bremen, D-28334 Bremen, Germany
(faiza@iup.physik.uni-bremen.de)

SCIAMACHY(Scanning Imaging Absorption spectroMeter for Atmospheric ChartographY) onboard the European Space Agency's ENVIronmental SATellite (ENVISAT) observes the earth's atmosphere in the nadir, limb and solar/lunar occultation geometry in UV-NIR (240nm – 2380nm) spectral range. The instrument provides total columns as well as vertical profiles of the atmospheric trace gases that are relevant to the ozone chemistry, air pollution and global climate change issues, from the troposphere upto the mesosphere.

The water vapor has a longer chemical lifetime in the stratosphere and in the polar region it accounts for the chemistry and dynamics. The amounts of water vapor in the polar stratosphere directly influence the ozone depletion by controlling the polar vortex temperatures and thereby the formation temperature of the polar stratospheric clouds. The southern hemispheric stratospheric number density profiles of water vapor have been retrieved over the high southern latitudes ($\sim$50ºS – 90ºS) from the lunar transmission spectra measured by SCIAMACHY from 2003 to present. The water vapor profiles are retrieved in the altitude range 17-50 km using the spectral window 1350-1420 nm. The validation of this water vapor product has been carried out using the correlative solar occultation spectra measured by other instruments such as the satellite instrument ACE-FTS (Atmospheric Chemistry Experiment Fourier Transform Spectrometer) and HALOE (HALogen Occultation Experiment). The results of these comparisons are presented here. For the Antarctic region, there is a coverage scarcity of the atmospheric trace gases by the satellite or ground based instruments. A validated dataset of water vapor vertical distribution retrieved from SCIAMACHY lunar occultation measurements is expected to facilitate the understanding of the physical and chemical processes in the southern hemisphere. First steps towards the interpretation and analysis of water vapor distribution in the southern region are highlighted in the presented study.