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Validation of water vapor retrieval in the upper troposphere and lower stratosphere from SCIAMACHY limb measurements

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The upper troposphere and lower stratosphere (UTLS) is a region of special interest for a variety of dynamical and chemical processes in the atmosphere. Nevertheless, there are not many measurements which offer both, long data series and a dense coverage within the UTLS.We retrieve water vapor in the UTLS region from limb measurements from the SCanning Imaging Absorption spectroMeter for Atmospheric CHartograpY (SCIAMACHY).

Water vapor is retrieved in an altitude range of about 12 to 23 km with a vertical resolution between 2 and 6 km. SCIAMACHY measures continuously since 2002 and requires 6 days to reach global coverage at the equator. Hence, data retrieved from the SCIAMACHY limb mode combine the advantage of a fairly dense horizontal sampling, good vertical resolution, and a long time series.

Here, a validation of the SCIAMACHY water vapor retrieval is presented. The retrieved water vapor is compared to several other satellite instruments e.g. the Atmospheric Chemistry Experiment-Fourier Transform Spectrometer (ACE-FTS), the Michelson Interferometer for Passive Atmospheric Sounding (MIPAS), the Microwave Limb Sounder (MLS) and in situ measurements.