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Application of the Spectral Structure Parameterization technique: retrieval of total water vapor columns from GOME

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Abstract. We use a recently proposed spectral sampling technique for measurements of atmospheric transmissions called the Spectral Structure Parameterization (SSP) in order to retrieve total water vapor columns (WVC) from reflectivity spectra measured by the Global Ozone Monitoring Experiment (GOME). SSP provides a good compromise between efficiency and speed when performing retrievals on highly structured spectra of narrow-band absorbers like water vapor. We show that SSP can be implemented in a radiative transfer scheme which treats both direct-path absorption and absorption by singly-scattered light directly. For the retrieval we exploit a ro-vibrational overtone band of water vapor located in the visible around 590 nm. We compare our results to independent values given by the data assimilation model of ECMWF. In addition, results are compared to those obtained from the more accurate, but more computationally expensive, Optical Absorption Coefficient Spectroscopy (OACS).

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