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Stratospheric Aerosol Profiles from SCIAMACHY Solar Occultation

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Abstract

The SCIAMACHY instrument on ENVISAT provided measurements of various atmospheric constituents in multiple viewing geometries from 2002 to 2012. Here, we present a new approach to derive aerosol extinction profiles from SCIAMACHY solar occultation measurements based on an onion peeling method similar to the Onion Peeling DOAS retrieval, which has already been successfully used for the derivation of greenhouse gas profiles (see e.g. Noël et al., ACP, 2018).
The retrieval of aerosol extinction requires as input a measured transmission in absolute units. Therefore, the most challenging part in the determination of the aerosol extinction is the radiometric calibration of the SCIAMACHY solar occultation measurements, which needs to consider various instrumental and atmospheric effects (like scan over the sun and refraction).
In this presentation we will describe the new calibration and retrieval method, present first results of stratospheric aerosol extinction profiles and comparisons with independent data sets.

Reference:
Noël, S., K. Weigel, K. Bramstedt, A. Rozanov, M. Weber, H. Bovensmann and J. P. Burrows, Water vapour and methane coupling in the stratosphere observed using SCIAMACHY solar occultation measurements, Atmos. Chem. Phys., 18(7), 4463-4476, 2018, doi: 10.5194/acp-18-4463-2018.