

Sciamachy Limb Measurements of NO₂, BrO and OCIO

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The Scanning Imaging Absorption Spectrometer for Atmospheric Chartography (SCIAMACHY) measures scattered sun radiances also in limb viewing mode, which allows determining vertical profiles of atmospheric trace gases. First results on the retrieval of NO₂, BrO and OCIO profiles from the SCIAMACHY Limb measurements are presented. For the profile retrieval we use a two step approach: First, differential Slant Column Densities (dSCDs) of the respective absorber are determined in the UV/VIS spectral range by Differential Optical Absorption Spectroscopy (DOAS). Inversion of the retrieved SCDs (as function of tangent height) yields vertical profiles of the trace gas concentration (as function of altitude). For that purpose, we apply an optimal estimation method, utilizing box air mass factors calculated by the full spherical radiative transfer model TRACY as weighting functions. The influence of several parameters on the quality of the profile retrieval, like the wavelength range chosen as fitting window, the trace gas reference spectra included in the DOAS fit or the choice of the Fraunhofer reference, is examined. In addition, the significance of the obtained dataset of concentration profiles of NO₂, BrO and OCIO for studies on stratospheric chemistry is discussed and the agreement with other space borne measurements of stratospheric trace gas profiles (SMR on ODIN, MLS on AURA) is investigated in case studies.