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Vertical profiles of BrO and OClO measured by SCIAMACHY

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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 BrO and OClO profiles from the SCIAMACHY Limb measurements are presented. Both species are of particular interest regarding stratospheric ozone chemistry. 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 significance of the obtained dataset of concentration profiles of BrO and OClO for studies on stratospheric chemistry is discussed. The long term evolution of both species is presented, with particular emphasis on the Polar Regions. Inter-annual and inter-hemispheric differences in the profile shape are studied in the context of stratospheric dynamics and chemistry. Also, the agreement with other space borne measurements of stratospheric trace gas profiles (SMR on ODIN, MLS on AURA) is investigated in case studies. Furthermore a validation of the BrO profiles by balloon measurements is presented.