



## **Trace gas distributions retrieved by SCIAMACHY on ENVISAT by a tomographic retrieval scheme in comparison with the general circulation model EMAC**

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The Scanning Imaging Absorption spectroMeter for Atmospheric CHartographY (SCIAMACHY) on the ENVISAT satellite probed the atmosphere at the day side of Earth in alternating sequences of nadir and limb measurements from 2002 to April 2012.

Limb measurements performed at different tangent heights contain information about profiles of various trace gases in the stratosphere. The retrieval of stratospheric trace gases ( $\text{NO}_2$ , BrO and OCIO) is performed by Differential Optical Absorption Spectroscopy (DOAS) followed by an inversion to horizontally resolved vertical profiles. The retrieval performed for a single limb scanning sequence has high vertical but poor horizontal resolution. In this study, however, a tomographic inversion approach is applied where all limb scanning sequences along a single orbit are combined in one inversion. Adding nadir measurements to the retrieval scheme as well is possible for SCIAMACHY. The tomographic approach, involving either only limb or even additionally nadir measurements, minimizes errors caused by the horizontal inhomogeneity especially around stratospheric transport barriers.

We study the effect of including nadir measurements to improve the tomographic retrieval scheme in comparison to the limb only tomography. In addition, the retrieval results will be compared to model results from the atmospheric general circulation model EMAC.