



Retrieval of Stratospheric Trace Gases from SCIAMACHY Limb Measurements

J. Pukite (1,2), S. Kühl (1), W. Wilms-Grabe (1), T. Deutschmann (1), C. von Friedeburg (1,3) U. Platt (1), T. Wagner (1)

(1) Institute of Environmental Physics, University of Heidelberg, Heidelberg, Germany, (2) Institute of Atomic Physics and Spectroscopy, University of Latvia, Riga, Latvia (3) Now at the Wiley-VCH / Editorial Office Physics, Berlin, Germany
(Janis.Pukite@iup.uni-heidelberg.de / Fax: +49 6221 546405 / phone: +49 6221 46354)

Stratospheric profiles of various trace gases can be retrieved from limb measurements performed by SCanning Imaging Absorption spectroMeter for Atmospheric CHartography (SCIAMACHY) instrument on ENVISAT satellite.

A two-step method is used to retrieve stratospheric distribution of NO₂, BrO and OClO. In the first step, slant column densities (SCDs) for the trace gases are derived from the SCIAMACHY limb spectra by Differential Optical Absorption Spectroscopy (DOAS) method. Second, the trace gases SCDs are converted into vertical concentration profiles applying radiative transfer modeling. The inversion is performed by an optimal estimation method.

The retrieval algorithm includes radiative transfer modeling performed by full spherical radiative transfer model "Tracy". The Monte Carlo RTM method implements completely statistical approach of light paths and light scattering and absorption in the atmosphere, however it is time consuming and therefore it cannot be repeated for every iteration that requires reasonable linearisation to an a-priori atmosphere.

We demonstrate the current status of the retrieval: the results agree well with climatological expectations and results acquired from other instruments.