

## **Three years operation of the SCIAMACHY instrument: limb viewing mode**

Alexei Rozanov, Christian von Savigny, Guenter Rohen, Heinrich Bovensmann, John Burrows, Vladimir Rozanov

University of Bremen

alex@iup.physik.uni-bremen.de

The Scanning Imaging Absorption Spectrometer for Atmospheric Cartography (SCIAMACHY) launched on board the European Environment Satellite (ENVISAT-1) in March 2002 is one of the newest space-borne instruments intended to improve our knowledge of the atmospheric physics and chemistry. The SCIAMACHY instrument measures the scattered and reflected spectral radiance in nadir and limb geometry and the spectral radiance transmitted through the atmosphere in solar/lunar occultation geometry in the spectral region 240 - 2380 nm. Retrievals of SCIAMACHY measurements demonstrate a huge potential of the space-borne instruments for the global monitoring of the important atmospheric species. Whereas measurements in nadir viewing mode performed by the SCIAMACHY instrument continue the series of global observations performed by the precursor nadir viewing instrument GOME, the new limb viewing geometry offers a lot of new possibilities related to the investigation of the vertical distributions of atmospheric species on the global scale. This contribution is focused on the results obtained from the SCIAMACHY limb measurements during the first three years of the instrument operation. The vertical coverage of the limb products ranges from the mesosphere through the stratosphere to the tropopause region. Vertical distributions of such important atmospheric trace gases as ozone, NO<sub>2</sub>, BrO, and, OCIO can be derived from the measurements performed by SCIAMACHY in limb viewing geometry. Additionally, these measurements can be used to derive the mesospheric temperature and to detect Polar Stratospheric Clouds (PSCs) and Noctilucent Clouds (NLCs). Such important issues as the major stratospheric warming in September-October 2002 and solar proton event (SPE) in October-November 2003 were investigated using the SCIAMACHY data.