

Stratospheric Monitoring with Envisat/SCIAMACHY Limb Measurements

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SCIAMACHY, the Scanning Imaging Absorption spectroMeter for Atmospheric Chartography, is an 8-channel UV/visible/NIR grating spectrometer on the European Space Agency's Envisat spacecraft. Envisat orbits the Earth in a polar sun-synchronous orbit with a 10 a.m. descending node allowing for measurements covering latitudes between about 85°S and 85°N. SCIAMACHY measures scattered, transmitted and/or reflected solar radiation in Nadir, Occultation and Limb-geometry. The Limb-scattering geometry - the focus of this contribution - provides retrievals of stratospheric profiles of several minor constituents with good vertical resolution (about 3 km) and near-global geographical coverage.

At the Institute of Environmental Physics in Bremen scientific data processors were developed to retrieve stratospheric profiles of O₃, NO₂, BrO and within the polar vortex also OCIO within about one day after data acquisition. O₃ and NO₂ are retrieved between 15 and 40 km altitude. In terms of BrO the 15 - 30 km altitude range is covered. For O₃ a separate upper stratospheric/lower mesospheric retrieval is available covering the 35 - 65 km altitude range. The retrieval results are graphically provided to the public via the scia-arc web-interface (<http://www.iup.physik.uni-bremen.de/scia-arc/>) as value-added data products. Apart from the minor constituent profiles SCIAMACHY provides PSC (polar stratospheric cloud) maps, which are also available on the scia-arc website.

This contribution gives an overview of the stratospheric applications of SCIAMACHY Limb-Scatter measurements, the data retrieval processors, error budgets and validation results. Furthermore, scientific mission highlights and data usage examples are presented.