Atmospheric Chemistry and Physics
An Interactive Open Access Journal of the European Geosciences Union

Atmos. Chem. Phys., 5, 2593-2602, 2005
www.atmos-chem-phys.net/5/2593/2005/

Spatial and temporal characterization of SCIAMACHY limb pointing errors during the first three years of the mission

C. von Savigny[1], J. W. Kaiser[2], H. Bovensmann[1], J. P. Burrows[1], I. S. McDermid[3], and T. Leblanc[3]

[1]Institute of Environmental Physics (IUP/IFE), University of Bremen, Otto-Hahn-Allee 1, 28334 Bremen, Germany

[2]Remote Sensing Laboratories, University of Zürich, Winterthurerstrasse 190, 8057 Zürich, Switzerland

[3]Jet Propulsion Laboratory, California Institute of Technology, Table Mountain Facility, Wrightwood, CA 92397–0367, USA

Abstract. Limb scattering retrievals of atmospheric minor constituent profiles require highly accurate knowledge of the tangent heights during the measurements. The limb scattering measurements of the Scanning Imaging Absorption spectroMeter for Atmospheric CartograpHY (SCIAMACHY) on Envisat are affected by tangent height errors of up to 2 km. This contribution provides a summary of the temporal and spatial variation of the SCIAMACHY limb pointing errors during the first three years of the SCIAMACHY mission. The tangent height errors are retrieved from the limb measurements in the UV-B spectral range. A seasonal modulation of the monthly mean tangent height offsets is identified with amplitudes of 800m (220m) before (after) the improvement of the Envisat orbit propagator model in December 2003. Even after the December 2003 orbit model improvement a constant offset component of about 1km is present. Furthermore, pointing discontinuities are identified that coincide with the daily updates of the on-board orbit propagator model. In order to reduce the errors in ozone profile retrievals caused by pointing errors to less than 5%, the tangent heights have to be known to within 250m.

Final Revised Paper (PDF, 625 KB) Discussion Paper (ACPD)

Citation: von Savigny, C., Kaiser, J. W., Bovensmann, H., Burrows, J. P., McDermid, I. S., and Leblanc, T.: Spatial and temporal characterization of SCIAMACHY limb pointing errors during the first three years of the mission, Atmos. Chem. Phys., 5, 2593-2602, 2005. Bibtex EndNote Reference Manager