

Home

Online Library ACP

- Recent Final Revised Papers
- Volumes and Issues**
- Special Issues
- Library Search
- Title and Author Search

Online Library ACPD

Alerts & RSS Feeds

General Information

Submission

Review

Production

Subscription

Comment on a Paper



[Volumes and Issues](#) [Contents of Issue 5](#) [Special Issue](#)

Atmos. Chem. Phys., 6, 1293-1314, 2006

www.atmos-chem-phys.net/6/1293/2006/

© Author(s) 2006. This work is licensed under a Creative Commons License.

Inter-comparison of stratospheric O₃ and NO₂ abundances retrieved from balloon borne direct sun observations and Envisat/SCIAMACHY limb measurements

A. Butz^{1,2}, H. Bösch^{1,*}, C. Camy-Peyret², M. Chipperfield⁵, M. Dorf¹, G. Dufour^{2,**}, K. Grunow⁶, P. Jeseck², S. Kühl¹, S. Payan², I. Pepin², J. Pukite^{1,7}, A. Rozanov³, C. von Savigny³, C. Sioris⁴, T. Wagner¹, F. Weidner¹, and K. Pfeilsticker¹

¹Institut für Umweltphysik, University of Heidelberg, Heidelberg, Germany

²Lab. de Physique Moléculaire pour l'Atmosphère et l'Astrophysique (LPMAA), Univ. Pierre et Marie Curie, Paris, France

³Institute of Environmental Physics and Institute of Remote Sensing, University of Bremen, Bremen, Germany

⁴Harvard-Smithsonian Center for Astrophysics, Cambridge, USA

⁵Institute for Atmospheric Science, School of Earth and Environment, University of Leeds, Leeds, UK

⁶Meteorologisches Institut, Freie Universität Berlin, Berlin, Germany

⁷Institute of Atomic Physics and Spectroscopy, University of Latvia, Riga, Latvia

* now at: Jet Propulsion Laboratory, California Institute of Technology, Pasadena, USA

** now at: Department of Chemistry, University of Waterloo, Ontario, Canada, Latvia

Abstract. Stratospheric O₃ and NO₂ abundances measured by different remote sensing instruments are inter-compared: (1) Line-of-sight absorptions and vertical profiles inferred from solar spectra in the ultra-violet (UV), visible and infrared (IR) wavelength ranges measured by the LPMA/DOAS (Limb Profile Monitor of the Atmosphere/Differential Optical Absorption Spectroscopy) balloon payload during balloon ascent/descent and solar occultation are examined with respect to internal consistency. (2) The balloon borne stratospheric profiles of O₃ and NO₂ are compared to collocated space-borne skylight limb observations of the Envisat/SCIAMACHY satellite instrument. The trace gas profiles are retrieved from SCIAMACHY spectra using different algorithms developed at the Universities of Bremen and Heidelberg and at the Harvard-Smithsonian Center for Astrophysics. A comparison scheme is used that accounts for the spatial and temporal mismatch as well as differing photochemical conditions between the balloon and satellite borne measurements. It is found that the balloon borne measurements internally agree to within ± 10% and ± 20% for O₃ and NO₂, respectively, whereas the agreement with the satellite is ± 20% for both gases in the 20 km to 30 km altitude range and in general worse below 20 km.

[Final Revised Paper](#) (PDF, 2201 KB) [Discussion Paper](#) (ACPD)

Citation: Butz, A., Bösch, H., Camy-Peyret, C., Chipperfield, M., Dorf, M., Dufour, G., Grunow, K., Jeseck, P., Kühl, S., Payan, S., Pepin, I., Pukite, J., Rozanov, A., von Savigny, C., Sioris, C., Wagner, T., Weidner, F., and



Search ACP

Library Search

Author Search

News

- Sister Journals AMT & GMD
- Financial Support for Authors
- Journal Impact Factor
- Public Relations & Background Information

Recent Papers

01 | ACPD, 06 Jan 2009: Time-span and spatial-scale of regional new particle formation events over Finland and Southern Sweden

02 | ACPD, 06 Jan 2009: Comment on "Classification of aerosol properties derived from AERONET direct sun data" by G. P. Gobbi et al. (2007)

03 | ACPD, 06 Jan 2009: Observations of high rates of NO₂ – HONO conversion in the nocturnal atmospheric boundary layer in Kathmandu, Nepal

Pfeilsticker, K.: Inter-comparison of stratospheric O₃ and NO₂ abundances retrieved from balloon borne direct sun observations and Envisat/SCIAMACHY limb measurements, Atmos. Chem. Phys., 6, 1293-1314, 2006. [Bibtex](#) [EndNote](#) [Reference Manager](#)