

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

Impact
Factor
4.865

ISI
indexed



[Volumes and Issues](#) [Contents of Issue 8](#) [Special Issue](#)

Atmos. Chem. Phys., 5, 2109-2120, 2005

www.atmos-chem-phys.net/5/2109/2005/

© Author(s) 2005. This work is licensed under a Creative Commons License.

Surface pressure retrieval from SCIAMACHY measurements in the O₂ A Band: validation of the measurements and sensitivity on aerosols

B. van Dierenhoven, O. P. Hasekamp, and I. Aben
SRON National Institute for Space Research, Utrecht, The Netherlands

Abstract. We perform surface pressure retrievals from cloud-free Oxygen A band measurements of SCIAMACHY. These retrievals can be well validated because surface pressure is a quantity that is, in general, accurately known from meteorological models. Therefore, surface pressure retrievals and their validation provide important insight into the quality of the instrument calibration. Furthermore, they can provide insight into retrievals which are affected by similar radiation transport processes, for example the retrieval of total columns of H₂O, CO, CO₂ and CH₄. In our retrieval aerosols are neglected. Using synthetic measurements, it is shown that for low to moderate surface albedos this leads to an underestimation of the retrieved surface pressures. For high surface albedos this generally leads to an overestimation of the retrieved surface pressures. The surface pressures retrieved from the SCIAMACHY measurements indeed show this dependence on surface albedo, when compared to the corresponding pressures from a meteorological database. However, an offset of about 20 hPa was found, which can not be caused by neglecting aerosols in the retrieval. The same offset was found when comparing the retrieved surface pressures to those retrieved from co-located GOME Oxygen A band measurements. This implies a calibration error in the SCIAMACHY measurements. By adding an offset of 0.86% of the continuum reflectance at 756 nm to the SCIAMACHY reflectance measurements, this systematic bias vanishes.

[Final Revised Paper](#) (PDF, 1176 KB) [Discussion Paper](#) (ACPD)

Citation: van Dierenhoven, B., Hasekamp, O. P., and Aben, I.: Surface pressure retrieval from SCIAMACHY measurements in the O₂ A Band: validation of the measurements and sensitivity on aerosols, Atmos. Chem. Phys., 5, 2109-2120, 2005. [Bibtex](#) [EndNote](#) [Reference Manager](#)

Copernicus Publications
The Innovative Open Access Publisher

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 | ACP, 16 Feb 2009:
Total and partial cloud amount detection during summer 2005 at Westerland (Sylt, Germany)

02 | ACP, 16 Feb 2009:
Attribution of projected changes in summertime US ozone and PM_{2.5} concentrations to global changes

03 | ACP, 16 Feb 2009:
Simulation of dust aerosol and its regional feedbacks over East Asia using a regional climate model