



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
4.927

ISI
indexed



▣ Volumes and Issues ▣ Contents of Issue 23 ▣ Special Issue

Atmos. Chem. Phys., 9, 9197-9207, 2009

www.atmos-chem-phys.net/9/9197/2009/

© Author(s) 2009. This work is distributed under the Creative Commons Attribution 3.0 License.

Influence of scintillation on quality of ozone monitoring by GOMOS

V. F. Sofieva¹, V. Kan², F. Dalaudier³, E. Kyrölä¹, J. Tamminen¹, J.-L. Bertaux³, A. Hauchecorne³, D. Fussen⁴, and F. Vanhellemont⁴

¹Earth observation, Finnish Meteorological Institute, Helsinki, Finland

²Organization of Russian Academy of Sciences A.M. Obukhov Institute of Atmospheric Physics RAS, Moscow, Russia

³LATMOS, Université Versailles Saint-Quentin; CNRS/INSU, Verrières-le-Buisson, France

⁴Institut d'Aeronomie Spatiale de Belgique, Brussels, Belgium

Abstract. Stellar light passing through the Earth atmosphere is affected by refractive effects, which should be taken into account in retrievals from stellar occultation measurements. Scintillation caused by air density irregularities is a nuisance for retrievals of atmospheric composition. In this paper, we consider the influence of scintillation on stellar occultation measurements and on the quality of ozone retrievals from these measurements, based on experience of the GOMOS (Global Ozone Monitoring by Occultation of Stars) instrument on board the Envisat satellite.

In GOMOS retrievals, the scintillation effect is corrected using scintillation measurements by the fast photometer. We present quantitative estimates of the current scintillation correction quality and of the impact of scintillation on ozone retrievals by GOMOS. The analysis has shown that the present scintillation correction efficiently removes the distortion of transmission spectra caused by scintillations, which are generated by anisotropic irregularities of air density. The impact of errors of dilution and anisotropic scintillation correction on the quality of ozone retrievals is negligible. However, the current scintillation correction is not able to remove the wavelength-dependent distortion of transmission spectra caused by isotropic scintillations, which can be present in off-orbital-plane occultations. This distortion may result in ozone retrieval errors of 0.5–1.5% at altitudes 20–40 km. This contribution constitutes a significant percentage of the total error for bright stars. The advanced inversion methods that can minimize the influence of scintillation correction error are also discussed.

▣ [Final Revised Paper](#) (PDF, 2810 KB) ▣ [Discussion Paper](#) (ACPD)

Citation: Sofieva, V. F., Kan, V., Dalaudier, F., Kyrölä, E., Tamminen, J., Bertaux, J.-L., Hauchecorne, A., Fussen, D., and Vanhellemont, F.: Influence of scintillation on quality of ozone monitoring by GOMOS, Atmos. Chem. Phys., 9, 9197-9207, 2009. ▣ [Bibtex](#) ▣ [EndNote](#) ▣ [Reference Manager](#)



Search ACP

Library Search

Author Search

News

- Sister Journals AMT & GMD
- Public Relations & Background Information

Recent Papers

01 | ACPD, 23 Dec 2009: Airborne measurements of aerosol optical properties related to early spring transport of mid-latitude sources into the Arctic

02 | ACPD, 23 Dec 2009: Organic aerosol components observed in worldwide datasets from aerosol mass spectrometry

03 | ACPD, 23 Dec 2009: Optimal estimation of the surface fluxes of methyl chloride using a 3-D global chemical transport model

