

[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 1](#) [Special Issue](#)

Atmos. Chem. Phys., 5, 153-167, 2005

www.atmos-chem-phys.net/5/153/2005/

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

Subtropical trace gas profiles determined by ground-based FTIR spectroscopy at Izaña (28° N, 16° W): Five-year record, error analysis, and comparison with 3-D CTMs

M. Schneider¹, T. Blumenstock¹, M. P. Chipperfield², F. Hase¹, W. Kouker¹, T. Reddman¹, R. Ruhnke¹, E. Cuevas³, and H. Fischer¹

¹IMK-ASF, Forschungszentrum Karlsruhe, Karlsruhe, Germany

²Institute for Atmospheric Science, University of Leeds, Leeds, UK

³Observatorio Atmosférico de Izaña, Instituto Nacional de Meteorología, Spain

Abstract. Within the framework of the NDSC (Network for the Detection of Stratospheric Change) ground-based FTIR solar absorption spectra have been routinely recorded at Izaña Observatory (28° N, 16° W) on Tenerife Island since March 1999. By analyzing the shape of the absorption lines, and their different temperature sensitivities, the vertical distribution of the absorbers can be retrieved. Unique time series of subtropical profiles of O₃, HCl, HF, N₂O, and CH₄ are presented. The effects of both dynamical and chemical annually varying trace gas cycles can be seen in the retrieved profiles. These include enhanced upwelling and photochemistry in summer and a more disturbed atmosphere in winter, which are typical of the subtropical stratosphere. A detailed error analysis has been performed for each profile. The output from two different three-dimensional (3-D) chemical transport models (CTMs), which are forced by ECMWF analyses, are compared to the measured profiles. Both models agree well with the measurements in tracking abrupt variations in the atmospheric structure, e.g. due to tropical streamers, in particular for the lower stratosphere. Simulated and measured profiles also reflect similar dynamical and chemical annual cycles. However, the differences between their mixing ratios clearly exceed the error bars estimated for the measured profiles. Possible reasons for this are discussed.

[Final Revised Paper](#) (PDF, 853 KB) [Discussion Paper](#) (ACPD)

Citation: Schneider, M., Blumenstock, T., Chipperfield, M. P., Hase, F., Kouker, W., Reddman, T., Ruhnke, R., Cuevas, E., and Fischer, H.: Subtropical trace gas profiles determined by ground-based FTIR spectroscopy at Izaña (28° N, 16° W): Five-year record, error analysis, and comparison with 3-D CTMs, Atmos. Chem. Phys., 5, 153-167, 2005. [Bibtex](#) [EndNote](#) [Reference Manager](#)

[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, 04 Feb 2009: Reinterpreting aircraft measurements in anisotropic scaling turbulence

02 | ACP, 04 Feb 2009: Global temperature estimates in the troposphere and stratosphere: a validation study of COSMIC/FORMOSAT-3 measurements

03 | ACPD, 04 Feb 2009: Cloud condensation nuclei in pristine tropical rainforest air of Amazonia: size-resolved measurements and modeling of atmospheric aerosol