

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 12

Atmos. Chem. Phys., 9, 4145-4156, 2009

www.atmos-chem-phys.net/9/4145/2009/

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

^{36}Cl bomb peak: comparison of modeled and measured data

U. Heikkilä^{1,*}, J. Beer¹, J. Feichter², V. Alfimov³, H.-A. Synal³, U. Schotterer⁴, A. Eichler⁴, M. Schwikowski⁵, and L. Thompson⁶

¹EAWAG, Dübendorf, Switzerland

²Max Planck Institute for Meteorology, Hamburg, Germany

³Federal Institute of Technology (ETH) Zurich/Paul Scherrer Institute, Villigen, Switzerland

⁴Division of Climate and Environmental Physics, Physics Institute, University of Bern, Switzerland

⁵Paul Scherrer Institute, Villigen, Switzerland

⁶School of Earth Sciences, The Ohio State University, USA

* now at: Bjerknes Centre for Climate Research, Bergen, Norway

Abstract. The extensive nuclear bomb testing of the fifties and sixties and the final tests in the seventies caused a strong ^{36}Cl peak that has been observed in ice cores world-wide. The measured ^{36}Cl deposition fluxes in eight ice cores (Dye3, Fiescherhorn, Grenzgletscher, Guliya, Huascarán, North GRIP, Inylchek (Tien Shan) and Berkner Island) were compared with an ECHAM5-HAM general circulation model simulation (1952–1972). We find a good agreement between the measured and the modeled ^{36}Cl fluxes assuming that the bomb test produced global ^{36}Cl input was ~80 kg. The model simulation indicates that the fallout of the bomb test produced ^{36}Cl is largest in the subtropics and mid-latitudes due to the strong stratosphere-troposphere exchange. In Greenland the ^{36}Cl bomb signal is quite large due to the relatively high precipitation rate. In Antarctica the ^{36}Cl bomb peak is small but is visible even in the driest areas. The model suggests that the large bomb tests in the Northern Hemisphere are visible around the globe but the later (end of sixties and early seventies) smaller tests in the Southern Hemisphere are much less visible in the Northern Hemisphere. The question of how rapidly and to what extent the bomb produced ^{36}Cl is mixed between the hemispheres depends on the season of the bomb test. The model results give an estimate of the amplitude of the bomb peak around the globe.

Final Revised Paper (PDF, 580 KB) Discussion Paper (ACPD)

Citation: Heikkilä, U., Beer, J., Feichter, J., Alfimov, V., Synal, H.-A., Schotterer, U., Eichler, A., Schwikowski, M., and Thompson, L.: ^{36}Cl bomb peak: comparison of modeled and measured data, Atmos. Chem. Phys., 9, 4145-4156, 2009. Bibtex EndNote Reference Manager



Search ACP

Library Search

Author Search

News

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

Recent Papers

01 | ACP, 23 Jun 2009: Surface ozone at the Caucasian site Kislovodsk High Mountain Station and the Swiss Alpine site Jungfrauoch: data analysis and trends (1990–2006)

02 | ACPD, 23 Jun 2009: Slower CCN growth kinetics of anthropogenic aerosol compared to biogenic aerosol observed at a rural site

03 | ACP, 23 Jun 2009: ^{36}Cl bomb peak: comparison of modeled and measured data