

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](#)

Atmos. Chem. Phys., 6, 173-185, 2006  
www.atmos-chem-phys.net/6/173/2006/  
© Author(s) 2006. This work is licensed  
under a Creative Commons License.

## A case study of pyro-convection using transport model and remote sensing data

R. Damoah<sup>1</sup>, N. Spichtinger<sup>1</sup>, R. Servranckx<sup>2</sup>, M. Fromm<sup>3</sup>,  
E. W. Eloranta<sup>4</sup>, I. A. Razenkov<sup>4</sup>, P. James<sup>5</sup>, M. Shulski<sup>6</sup>, C. Forster<sup>7</sup>,  
and A. Stohl<sup>7</sup>

<sup>1</sup>Department of Ecology, Technical University of Munich, Freising, Germany

<sup>2</sup>Canadian Meteorological Centre, Montreal, Canada

<sup>3</sup>Naval Research Laboratory, Washington, D.C., USA

<sup>4</sup>University of Wisconsin-Madison, Madison, WI, USA

<sup>5</sup>Hadley Centre for Climate Prediction and Research, Exeter, UK

<sup>6</sup>Alaska Climate Research Center, Fairbanks, AK, USA

<sup>7</sup>Norwegian Institute for Air Research, Kjeller, Norway

**Abstract.** Summer 2004 saw severe forest fires in Alaska and the Yukon Territory that were mostly triggered by lightning strikes. The area burned ( $>2.7 \times 10^6$  ha) in the year 2004 was the highest on record to date in Alaska. Pollutant emissions from the fires lead to violation of federal standards for air quality in Fairbanks.

This paper studies deep convection events that occurred in the burning regions at the end of June 2004. The convection was likely enhanced by the strong forest fire activity (so-called pyro-convection) and penetrated into the lower stratosphere, up to about 3 km above the tropopause. Emissions from the fires did not only perturb the UT/LS locally, but also regionally. POAM data at the approximate location of Edmonton (53.5° N, 113.5° W) show that the UT/LS aerosol extinction was enhanced by a factor of 4 relative to unperturbed conditions. Simulations with the particle dispersion model FLEXPART with the deep convective transport scheme turned on showed transport of forest fire emissions into the stratosphere, in qualitatively good agreement with the enhancements seen in the POAM data. A corresponding simulation with the deep convection scheme turned off did not result in such deep vertical transport. Lidar measurements at Wisconsin on 30 June also show the presence of substantial aerosol loading in the UT/LS, up to about 13 km. In fact, the FLEXPART results suggest that this aerosol plume originated from the Yukon Territory on 25 June.

[Final Revised Paper](#) (PDF, 3795 KB) [Discussion Paper](#) (ACPD)

Citation: Damoah, R., Spichtinger, N., Servranckx, R., Fromm, M., Eloranta, E. W., Razenkov, I. A., James, P., Shulski, M., Forster, C., and Stohl, A.: A case study of pyro-convection using transport model and remote sensing data, Atmos. Chem. Phys., 6, 173-185, 2006. [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 | ACP, 23 Dec 2008:  
Measurement of glyoxal using an incoherent broadband cavity enhanced absorption spectrometer

02 | ACPD, 23 Dec 2008:  
Single particle characterization using a light scattering module coupled to a time-of-flight aerosol mass spectrometer

03 | ACP, 23 Dec 2008:  
Corrigendum to "Modeling the effect of plume-rise on the transport of carbon monoxide over Africa with NCAR CAM" published in

