

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 5

Atmos. Chem. Phys., 4, 1201-1215, 2004

www.atmos-chem-phys.net/4/1201/2004/

© Author(s) 2004. This work is licensed under a Creative Commons License.

Aerosol-ozone correlations during dust transport episodes

P. Bonasoni¹, P. Cristofanelli¹, F. Calzolari¹, U. Bonafè¹, F. Evangelisti¹, A. Stohl², S. Zauli Sajani³, R. van Dingenen⁴, T. Colombo⁵, and Y. Balkanski⁶

¹National Research Council, Institute for Atmospheric Science and Climate, via Gobetti 101, 40129, Bologna, Italy

²Cooperative Institute for Research in the Environmental Sciences, University of Colorado/NOAA Aeronomy Laboratory, USA

³Agenzia Regionale Prevenzione e Ambiente dell'Emilia-Romagna, Struttura Tematica Epidemiologia Ambientale, Modena, Italy

⁴Joint Research Center, Ispra, Italy

⁵Ufficio Generale per la Meteorologia, Pratica di Mare, Roma, Italy

⁶Laboratoire des Sciences du Climat et de l'Environnement, Gif-Sur-Yvette Cedex, France

Abstract. Its location in the Mediterranean region and its physical characteristics render Mt. Cimone (44°11' N, 10°42' E), the highest peak of the Italian northern Apennines (2165 m asl), particularly suitable to study the transport of air masses from the north African desert area to Europe. During these northward transports 12 dust events were registered in measurements of the aerosol concentration at the station during the period June–December 2000, allowing the study of the impact of mineral dust transports on free tropospheric ozone concentrations, which were also measured at Mt. Cimone. Three-dimensional backward trajectories were used to determine the air mass origin, while TOMS Aerosol Index data for the Mt. Cimone area were used to confirm the presence of absorbing aerosol over the measurement site.

A trajectory statistical analysis allowed identifying the main source areas of ozone and aerosols. The analysis of these back trajectories showed that central Europe and north and central Italy are the major pollution source areas for ozone and fine aerosol, whereas the north African desert regions were the most important source areas for coarse aerosol and low ozone concentrations. During dust events, the Mt. Cimone mean volume concentration for coarse particles was $6.18 \mu\text{m}^3/\text{cm}^3$ compared to $0.63 \mu\text{m}^3/\text{cm}^3$ in dust-free conditions, while the ozone concentrations were 4% to 21% lower than the monthly mean background values. Our observations show that surface ozone concentrations were lower than the background values in air masses coming from north Africa, and when these air masses were also rich in coarse particles, the lowest ozone values were registered. Moreover, preliminary results on the possible impact of the dust events on PM_{10} and ozone values measured in Italian urban and rural areas showed that during the greater number of the considered dust events, significant PM_{10} increases and ozone decreases have occurred in the Po valley.



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, 03 Mar 2009:
Wave fluxes of equatorial Kelvin waves and QBO zonal wind forcing derived from SABER and ECMWF temperature space-time spectra

02 | ACP, 03 Mar 2009:
Temperature dependence of yields of secondary organic aerosols from the ozonolysis of α -pinene and limonene

03 | ACPD, 02 Mar 2009:
How important is the vertical structure for the representation of aerosol impacts on the diurnal cycle

■ [Final Revised Paper](#) (PDF, 6743 KB) ■ [Discussion Paper](#) (ACPD)

Citation: Bonasoni, P., Cristofanelli, P., Calzolari, F., Bonafè, U., Evangelisti, F., Stohl, A., Zauli Sajani, S., van Dingenen, R., Colombo, T., and Balkanski, Y.: Aerosol-ozone correlations during dust transport episodes, *Atmos. Chem. Phys.*, 4, 1201-1215, 2004. ■ [Bibtex](#) ■ [EndNote](#) ■ [Reference Manager](#)