

Interactive comment on “Evolution of organic and inorganic components of aerosol during a Saharan dust episode observed in the French Alps” by G. Aymoz et al.

G. Aymoz et al.

Received and published: 30 September 2004

Reviewer #1

Specific comments

We essentially identified the dust event from the increase of PM₁₀ associated with that of the number of large particles, in the meteorological context described by the air mass trajectories and the satellite picture. However, the increase of soluble calcium is also a very good indicator of dust (as widely used by other authors), even if several other sources (now indicated in the text) can also produce this species in the aerosol. In our case, without large increases in NaCl or in EC concentrations, it is clear that the soluble calcium is not coming from a marine source nor from combustion sources, respectively.

The Saharan dust event is not identified with a specific ratio of concentrations between different species (see above). The paper outlines that, when using short time resolution as it is the case in this study, we can show that the ratios of species are variable within a single event and try to relate that to (variable) ratios previously observed in source regions or dust plumes away from the sources.

We slightly shortened some of the sections in the paper. However, we believe that it is rather interesting to compare our data to those from the 4 or 5 studies on the same topic, currently available in the open literature. These studies are showing rather different cases for the ratio between secondary inorganic species and calcium, indicating variable degree of interaction between dust and anthropogenic gases. In the same way, we provide the uncertainties on our calculations as a way to evaluate the range of the upper limits of the sulphate / calcium and nitrate / calcium ratios. These upper limits are, even if associated with large uncertainties, characteristic of low interactions between gases and dust particles.

Technical corrections

All of these were directly performed in the text.

Reviewer #2

Specific comments

A table (now table 1) was added, that presents the average values of concentrations during dust and non-dust periods.

We believe that most of the paper is dealing with the significance, reasons, and implications of the differences in concentrations and aerosol properties between the several periods covered by the sampling campaign. If the comment is about the evaluation of the level of confidence in the distinction between concentrations during dust and non dust period, we also believe that there is no doubt about the changes we are discussing in the paper. The uncertainties associated with the concentrations of ionic species and

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EC OC are about 10-15 % in the range of concentrations we are dealing with.

Throughout the text, we used correlations when it was possible to calculate them with enough samples available (mainly for the period before the dust event). During the dust event itself, there is only 4 or 5 filters concerned, a number too low to consider actual correlations. Therefore, everywhere in the text for this last case, we removed the word “correlation”. We understand that such a low number of time steps to derive a co evolution between species is a weakness of the paper, but this time series is one of the first (to the best of our knowledge) with such a fine resolution.

Technical corrections

All of these were directly performed in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 3875, 2004.

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