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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Sources and distribution of trace species in Alpine precipitation inferred from two 60-year ice core paleorecords" *by* A. Eichler et al.

Anonymous Referee #1

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General comments

This paper presents a comparison between two ice core records of chemical species, in the north and south parts of the Swiss Alps, respectively. It tries to interpret the data sets in terms of source regions and transport pathways in relation with weather patterns, and their overall changes over the last decades. The paper is doing a good work at presenting the data sets and the differences between them. The connections with source regions, weather patterns, transport pathways, and emissions inventory are presented in broad and general ways that can probably only be considered as preliminary investigations.

On a general point of view, the English can largely be improved, and it is a pity that too

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many references are in German, in a not so open literature.

Specific comments

The paper should address the aspects dealing with :

Ţ the preservation of winter precipitation in the records

Ţ dry deposition and post deposition effects

Ţ concentrations vs fluxes o p 8 : how come that concentrations are equivalent while accumulation are so different ? o p15 : there is no change in accumulation pattern associated with the change in weather pattern in the 60s ?

The authors should justify the use of logarithms for the calculation of correlations between concentrations series.

There should be a discussion on the importance of halite deposition with desert dust. There are now several papers dealing with the mineralogy of Saharan dust episodes over Europe showing that NaCl from evaporites is one of the minerals frequently seen. It could explain (in part) the correlation found between Şsea salt speciesŤ and Şcrustal speciesŤ at GG. Further, the paper could try to discriminate source regions of Saharan dust in northern Africa according to elemental ratios, as the different regions leading to emissions do not have the same signature. It is also likely that transport pathways presented in figure 5 are not associated with the same sources areas in northern Africa.

The 3rd sentence on page 13 (lines 3-4-5) is not understandable.

Do you have a reference for the equivalence in SO2 emissions between summer and winter (over Europe ?) (re, p13).

P14, 3rd line of 2nd para : what do you mean by Ştaken as oneŤ ?

P16 3rd line of section A) : there is some inconsistency between ŞĚ.small scale convective precipitationĚ.Ť and ŞFrance and France and Italy as source areasĚ.Ť

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Technical corrections

P14 : first line of 2nd para : figures 8A and B are essentially showing transport pathways, not sources areas

P23 : some typos in table 2

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 71, 2004.