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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Size-segregated aerosol mass closure and chemical composition in Monte Cimone (I) during MINATROC" *by* J.-P. Putaud et al.

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As said in a previous comment on the large particle size fraction, the proposed approach to combine chemistry, gravimetry and optical aerosol measurements is very interesting. I have a few questions and suggestions regarding the apportionment of the different aerosol components (mineral dust, pollution, seasalt, ...)

I find that the description of figure 1 in the section 2.1 Site and Meteorology should be somewhat enhanced. Interpretation of the figure is not clear to me since I would expect high CO2, rather than low CO2, corresponds to polluted air. I think that comments at the beginning of section 3.2 would also better come into section 2.1.

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Chiapello et al. (1999) found necessary to account for the crustal contribution of sodium before using it as a tracer of seasalt. Indeed, the average Na/Al ratio is about 0.3 in the crust and even about 0.9 in average soils. In the case of Saharan dust plume advection the seasalt contribution may be overestimated (fig. 7).

Chiapello et al. (1999) also account for crustal sulfur contribution due to the presence of Saharan dust. Does the dust component contribute to sulfate concentration during the Saharan advection?

Does Ca2+ from Hi-Vol samples coincides with the total Ca2+ from impactor stages? Hi-Vol and low pressure samples might be compared to cross-check samplers efficiency. Na+, and possibly other ions carried by sub-μm particles such as SO42-, can allow such comparison for both small and large particles.

It looks from fig. 2 that there is a high variability in the Ca2+/dust ratio in the absence of Saharan plume. Is the regression (r2=0.31) really significant and applicable? Ca has probably a seasalt source as well. It might be worth to analyze also Na+ in Hi-Vol samples (or sum Na+ from Berner impactor stages) in order to perform a multiple regression between Ca2+ and both dust and non-crustal Na.

Reference:

Chiapello et al.: Contribution of the different aerosol species to the aerosol mass load and optical depth over the northeastern tropical Atlantic, J. Geophys. Res., 104, 4025-4035, 1999.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 4097, 2003.