

Interactive comment on “Atmospheric measurements of gas-phase HNO₃ and SO₂ using chemical ionization mass spectrometry during the MINATROC field campaign 2000 on Monte Cimone” by M. Hanke et al.

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General comments:

This paper (i) presents the use of a chemical ionization mass spectrometry technique to monitor in ambient air the gas phase concentration of HNO₃ and SO₂ and (ii) demonstrates clearly that African air transporting dust over the Mediterranean sea to the Italian site on Monte Cimone is almost completely washed out from gas phase HNO₃. The results and the interpretation of the data from the field campaign are indeed a strong indication of an efficient uptake of gas-phase HNO₃ by atmospheric mineral-dust aerosol

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particles and are very useful to the community. However, it would have been very interesting to have more than one mineral dust event to verify the reproducibility of the results observed.

The paper is informative, clear, and the experimental part is very well detailed. The authors address also very interesting issues such as (i) the care taken to sample and to calibrate HNO₃ and (ii) a discussion about the contribution to the gas phase HNO₃ of evaporated nitric acid issued from the particles in the low pressure chemical ionization region.

I therefore recommend publication to ACP. I suggest to the authors to take in account the following comments for the final version of the paper.

Specific comments

1) Bi-diurnal trends in HNO₃ (fig. 10) and the negative correlation plots of HNO₃ concentration versus the integrated surface area of particles above 721 nm diameter (fig. 11) demonstrate the importance of the HNO₃ uptake by the African dust shown in Fig. 6 (July 3). However, I do not understand clearly why correlation plots are separated between small and big size particles (figs. 11 and 12). In opposition to Fig. 11, Fig. 12 shows a positive correlation between the gas phase HNO₃ concentration and the particles surface area below 559 nm diameter. Thus, I would expect a 0 slope correlation between the HNO₃ concentration and the total particles surface area? The authors should be more precise on the origins of the 2 size range particles and explain more clearly the reason why a positive correlation is observed in Fig. 12 (paragraph starting p2234, line 9)?

2) Apart from the low HNO₃ concentration data observed on the nights of June 5/6, June 19/20 and June and 22/23, can the authors explain the other low HNO₃ concentration data observed on Fig. 6 such as: on June 13-14 (Altitude classification : Boundary Layer ; Air-mass classification : Mediterranean basin)? on June 26 (Altitude classification : Boundary Layer ; Air-mass classification : Western Europe)?

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3) The authors should address the frequency of the calibrations performed just before, during and/or after the mineral dust event of July 3, since we could expect the calibration factor to change (or not ?) during the dust event due to a possible change for the distribution of the atmospheric species in the ambient air.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 2209, 2002.

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