Atmos. Chem. Phys. Discuss., 4, S757–S758, 2004
www.atmos-chem-phys.org/acpd/4/S757/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Aerosol-ozone correlations during dust transport episodes" *by* P. Bonasoni et al.

Anonymous Referee #2

Received and published: 19 May 2004

The paper confirms and provides additional experimental evidence for the occurrence of low O3 mixing ratios in Saharan dust air masses. The paper is well written and should be published in ACP with a few minor changes.

The question why the ozone mixing ratio is low in air masses with Saharan dust is the most interesting at the moment, since it could also answer the question if heterogeneous uptake of ozone on mineral dust aerosol should be taken into account in global model calculations.

As the authors state in the introduction the few measurements which are available from the Sahara region suggest low surface O3 mixing ratios in this region. Could the low O3 mixing ratios observed at Mt. Cimone just be a transport phenomenon? The authors try to answer this question by comparing the O3 mixing ratios in air masses originating

from Northern Africa which contain mineral dust aerosols with Northern African air masses without dust. This is probably the best you can do considering the available dataset. However, for this part I have a few comments:

1. The authors use 10-back trajectories to determine the origin of the air masses, however it is not exactly described how they did this. It is described that 10-day back trajectories were calculated, but the travel time from North Africa to the measurement station was on average 64 hours. For the Figures 4, 5, 6 and 9 a sophisticated method is used to account for all positions of the trajectories during its transport. Could this method also be used for the analysis of the air mass origin? Moreover, it is probably most important when the air mass was lifted from the ground, in order to determine if the air mass really originates from the North African boundary layer. This might be hard to do with a trajectory model, but it should be better analysed in the paper.

2. The average O3 mixing ratios for North African air masses with and without dust, which are stated in section 3 on page 2069, are not significantly different. They are within one standard deviation from each other.

3. Figure 12, however, shows a convincing difference between the two air mass types, but no indication of the variation in O3 concentrations is given. Error bars should be added in order to give the reader the chance to judge the difference.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 2055, 2004.