

## ***Interactive comment on “Chemical characteristics assigned to trajectory clusters during the MINOS campaign” by M. Traub et al.***

### **Anonymous Referee #1**

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#### General comments:

In the paper by Traub et al. cluster analysis of trajectories is used in order to analyze trace gas measurement data obtained during research flights in the framework of the MINOS campaign. The data are first stratified according to the measurement height and second according to trajectory cluster membership. Concentrations of many trace gases showed very different mean values at the different levels and in the different clusters. The paper is suitable to be published in ACP, however, only after major modifications.

My largest concern is that the trajectories have been clustered only according to their horizontal position. Thus, the trajectories in a cluster may have originated from very different levels in the atmosphere. Particularly, it is of little relevance whether an air

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parcel has crossed over a continent at altitudes above the planetary boundary layer, because no emissions can be taken up by such an air parcel. This should be taken into account somehow, for instance, by excluding (for the 0-2 km trajectories, at least) trajectories that originated in the free troposphere. Similarly, for the higher levels, it should be distinguished between trajectories that originated in the stratosphere and such that originated in the troposphere, because, again, trace gas concentrations are very different in these two layers. This is currently mixed up, which I think makes the interpretation of the results difficult.

Also, the authors should explain better why they used 2-day trajectories in addition to the 5-day trajectories. As it stands now, I simply don't understand why this was done.

In my opinion, the paper is acceptable only after the above modifications have been made.

Additional specific comments:

Don't use NAONA as an abbreviation, because NAO normally stands for the North Atlantic Oscillation.

The lengthy explanation of the NAO is not really necessary, because the authors do not come back to this later in the paper.

I suggest to add a figure showing the flight tracks of the experiment.

I do not understand the conclusion that there is an additional pollution source from the North Atlantic region, on the basis of the comparison of the 2- and 5-day back trajectories. Both are arbitrary lengths, and both are too short to study a North American influence.

Page 115, line 3: It can NOT be seen that ALL trajectories with source regions in eastern Europe are associated with higher concentrations. It is only seen that they are associated with higher MEAN concentrations.

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It is not explained on page 119, when the Indian forward trajectories were started. Furthermore I believe that showing these trajectories is not really necessary. Remove Fig. 5.

Language:

p. 110, line 10: instrument`s

p. 110, line 15: Isn`t IAP an institute of DLR?

p. 115, line 10 and other places: North Atlantic region (not Region)

p. 116, line 8: ... as far north as those at ....

p. 117, line 13: ... trajectories ending between 4 and 8 km....

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Interactive comment on Atmos. Chem. Phys. Discuss., 3, 107, 2003.

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