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Atmospheric Chemistry and Physics Discussions

Interactive comment on "The impact of monsoon outflow from India and Southeast Asia in the upper troposphere over the eastern Mediterranean" *by* H. A. Scheeren et al.

Anonymous Referee #2

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The flights over the MINOS experiment over the eastern Mediterranean resulted in a picture of fascinating complexity of the impact of long-range pollutant transport in the upper troposphere. Supporting the analysis of the multitude of tracer measured on board the aircraft with backtrajectories and results from a chemical transport model the authors of this and companion papers demonstrate convincingly the influence of emissions from three different source regions, Europe, South Asia, and North America, in shaping the pollutant concentrations observed in the profiles near Crete. In the identification of the emissions from South Asia they build on the insights gained in the INDOEX experiment and the tell tale of the North American emissions is the new automobile cooling agent HFC-134a.

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SPECIFIC COMMENTS:

Measurement techniques: The description of the instrument characteristics needs to be cleaned up. In particular the authors may want to make sure that the sensitivity, accuracy, and time response that are quoted in the present manuscript are consistent with Traub et al.

The measurement list includes NO2, however, details of the NO2 measurement are missing.

Vertical distribution of trace gases: It is hard to distinguish the light and dark green symbols in Fig. 2. In the discussion of the air masses below 6 km the authors may want to refer to the Traub et al. paper when they mention the influence of the European emissions.

The trajectory shown in Fig. 4 clearly indicates the upward transport characteristic for a warm conveyor belt. However, for the trajectory shown in Fig. 4 one would not expect to see N. American pollution. The trajectory would rather suggest upward transport of a moist air mass of Caribbean origin. The timing of the upward transport will be critical in determining if this air mass is influenced by emissions over the southeastern United States or cleaner air from the North Atlantic (see also discussion in Cooper et al. of the NARE 97 flight on Sep. 26). A qualifying statement might be appropriate.

Model simulations of the upper troposphere:

In Fig. 10 and 11 the measurements taken over the eastern Mediterranean are projected on the longitudinal axis of origin with the help of the trajectory calculations.

How was the model sampled?

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 2285, 2003.