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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Formaldehyde over the eastern Mediterranean during MINOS: Comparison of airborne in-situ measurements with 3D-model results" *by* R. Kormann et al.

Anonymous Referee #2

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General comments:

The manuscript gives a fairly detailed and elaborate outline of airborne formaldehyde measurements over the Mediterranean. The measurement results are valuable and worth publishing in themselves as few such data are available today. Furthermore, the questions raised in the paper are of general interest. The paper is well written and presents the results in a fairly extensive manner.

Specific remarks:

The authors refer to trajectories and a 3D CTM in the interpretation of their data. However, the information given about the trajectories is very sparse and refers to a

manuscript submitted to the same journal issue. Without knowing more about the trajectory calculations it is difficult to judge the discussion related to this, e.g. the hypothesis that the mismatch between the model and the measurements in the upper troposphere is linked to the Indian monsoon. How "good" are the trajectories in simulating these presumably very rare events? A simple on-the-fly calculation using NOAA's HYSPLIT trajectories actually indicate westerly transport on 3rd Aug-01.

Furthermore, the authors could comment how they think their 3D model with a horizontal resolution of the order of 300 km is valid for comparison with "spot samples" as their airborne measurement data. Is this most crucial for comparison with low-altitude or high-altitude measurements? And what about e.g. sub-grid scale processes like convection? Could e.g. underestimation of deep convection provide an alternative explanation for the model's underestimation of formaldehyde? Additional measurements of short-lived primary species, if available, could shed more light on this. To support the hypothesis about biomass plumes from the Indian monsoon, somewhat more information could be given, e.g. about the CO level (during flight 2) and about the other so-called products of biofuel mentioned in the text (which components are that?).

Technical remark:

The figures are mostly very clear and readable. Figure 4 could, however, be somewhat improved by adding some space between the columns and by reducing the size of the legends (component names and axis values) thereby separating the characters.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 1303, 2003.