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Atmospheric Chemistry and Physics Discussions

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Interactive Comment

Interactive comment on "Microphysics and heterogeneous chemistry in aircraft plumes – high sensitivity on local meteorology and atmospheric composition" *by* S. K. Meilinger et al.

Anonymous Referee #2

Received and published: 5 October 2004

The paper by Meininger et al. on "Microphysics and heterogeneous chemistry in aircraft plumes..." is a fine piece of work, which deserves publication in ACP. The authors describe a new model for atmospheric chemistry and aerosol microphysics, which has been constructed on the basis of existing and well tested codes for the numerical FACSIMILE solver. Using this new models, the authors quantify the non-linear response for NOy and O3 formation depending on the exact conditions of the aircraft injection. The paper therefore constitutes an important step towards a more quantitative assessment of the impact of aircraft emissions on the tropopsheric chemical composition and climate radiative forcing, which have been identified as two major uncertainties in recent assessment reports. It would be interesting to see their results applied in a climatological study of the upper tropospheric meteorological conditions in a future paper.

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Interactive Discussion

Discussion Paper

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The manuscript is well written and I have only a couple of minor comments:

p4457, l.10: aerosol surface area densitites: is there no observational evidence for this, e.g. from DLR or NASA aircraft campaigns? l.16: for which species is this gamma value?

p4460, l.5: what is the model sensititivty to initial OH? (e.g. 1 ppm or 12ppm) l.14: the arrow indicates "convergence to", but what is meant here is "equal". Replace with =

p4461, l.2 : if the model is not documented elswhere (report, web site), a table with species and reactions should be given as appendix.

p4465, l.23: "parantheses" instead of "brackets"

p4466, l.3: delete "more than"

p4467, l.6: "stratosphereand" (missing white space)

p4468, l.11: this statement seems to be at odds with the figure: the lower right panel in Fig 4 does show ozone formation. Thus, the NOx injection cannot be "overcompensated" by denoxification.

Interactive comment on Atmos. Chem. Phys. Discuss., 4, 4455, 2004.

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