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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "An evaluation of the performance of chemistry transport models, Part 2: detailed comparison with two selected campaigns" *by* D. Brunner et al.

**Anonymous Referee #1**

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General Comments

This paper presents a detailed comparison of observations to several chemical transport models with a quantitative evaluation of the models' performance. While the specific results of the evaluation apply to the models used in the study, the paper illustrates very well new methods for model evaluation that can be used generally. The authors have organized and described these results well to make a valuable paper. I recommend publication after addressing the following comments.

Specific Comments

p.7357,ln 10+: I think 'evaluation' is a more appropriate word to use than 'validation' for the comparison of models with data. Validation can be used when referring to satellite data, but one can never expect the global models to precisely represent the atmosphere, so I think the best we can do is 'evaluate' how well they reproduce observations.

Section 3.1: It is not clear whether or not the data from the P3 aircraft during PEM-Tropics-A were included in this analysis. Also, in Figure 3, the NO data shown seem to be a very small subset of the data available around Tahiti. In Section 3.1.5, the number of flights, and their dates, shown in the profiles at Tahiti should be mentioned.

End of Section 3.1.5: Perhaps the high HNO3 in the models is from too much stratospheric transport? Differences between the models may also be due to different washout schemes. These might be worth mentioning here.

p. 7379 (ln 1): Table 1 indicates that CTM-2 simulates PAN with a less than 10% bias for each grouping of flights – that doesn't seem too poor to me.

Technical Corrections

p. 7357, l.29: Suggest change (grammar): 'In the first part of this study we presented a new observation database that was compiled ...'

p. 7359, l.17: reference for CTM-2?

p. 7360, l.17: 'campaign' -> 'campaigns'

p. 7369, l.11: 'condition' -> 'conditions'

p. 7370, l.27: Suggest change 'No PAN is simulated' to 'PAN is not simulated'.

p. 7373, l.9: I don't think you have defined 'NAFC'.

p. 7374, l.10: 'flights 4,6, ... ' (leave out 'number')

p. 7377, l.1: It might be clearer to say '... influence at these altitudes ...'



**ACPD**

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p. 7377, l.21: change to 'The diagrams allow comparison of the skills of the models ...'

p. 7378, l.26: '... in terms of NO (Fig. 6c).'

p. 7379, l.4: 'would be quite important' -> 'is quite important'

p. 7380, l.28: 'similar' -> 'similarly'

Table 1 caption: Isn't the bias: (model-meas)/meas*100% ?

Fig.2: much too small in current 'Print Version' - I trust final version will be larger, or split the panels across 2 pages.

Fig 7: What do the + symbols indicate?

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Interactive comment on Atmos. Chem. Phys. Discuss., 4, 7355, 2004.