

## ***Interactive comment on “TRADEOFFs in climate effects through aircraft routing: forcing due to radiatively active gases” by F. Stordal et al.***

### **Anonymous Referee #1**

Received and published: 14 December 2006

### **General comments**

The manuscript is a highly interesting and valuable contribution to the question how alternative flight altitudes and flight routes impact on the atmosphere and climate. This question is currently intensively discussed both in the science and policy makers communities. The manuscript should be published after the modifications/additions listed below.

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## Specific comments

1. Despite its valuable content the manuscript is written in a quite sloppy style, which makes it more difficult for the potential reader to digest the result. The authors should put more emphasis in preparing the text of the manuscript.
2. The abstract is too long and partly confusing. In particular the forward and backward looking metrics can only be understood if large fractions of the main text are read. A reader should be able to understand the abstract without reading the paper. The abstract should present the main results and should make the reader interested in reading the paper.
3. Page 10737, line 2 (abbreviated 37/2 in the following): LMDz is a CCM but is not used as a CCM in the present paper as the authors state some paragraphs below. Therefore they should NOT mention that they are applying a CCM , they rather use FOUR CTMs.
4. 37/6 - 40/22: Rather than presenting four pages of lengthy model descriptions with plenty of references not necessary in the context of the present manuscript, it would be more compact to present a table with the main features of the 4 models used (including one or two central references for each of the models).
5. 37/9: I guess the Oslo model is not a spectral model with T21 horizontal resolution. It is a grid point model with a resolution corresponding to the Gaussian grid associated to a T21 spectral model.
6. 41/11-13: Why is civil traffic more easily rerouted the military flights? The problem rather is that we do not know sufficiently enough about the spatial distributions of emissions from military aviatiuon.

7. 41/15-16: Also Sausen et al. (2005) scaled with a factor of 1.15. This should be mentioned here as the author compare their results with the results of Sausen et al..
8. 43/16 - 44/5: Which assumption have been made for background CO<sub>2</sub>? Constant emissions?
9. 47/6: What does this mean "positive in ULAQ, which is more difficult to explain"? If the authors know the reason they should share their knowledge and enlighten the reader. If not, they authors should confess this deficit and present at least some hypotheses.
10. 47/28: Why should we expect "1/3"?
11. 51/1: Fichter et al. report 50%.

### Technical comments

1. Page 10735. line 12 (abbreviated 35/12 in the following): Their is a recent paper on aircraft consuming liquid hydrogen: Ponater, M., S. Pechtl, R. Sausen, U. Schumann and G. Hüttig, 2006: Potential of the cryoplane technology to reduce aircraft climate impact: A state-of-the-art assessment. Atmos. Environ. 40, 6928-6944.
2. 38/2-3: Potentially it should read "calculations were performed". Check whether past tense, present tense and present perfect are correctly applied.
3. 40/2: Sentence is not complete; heading should not be part of the following sentence.

4. 41/1 - 44/5: Split into 2 sections "Experiment design" and "Radiative forcing estimates".
5. 44/12: Where is Fig 1a. I can only find Fig 1.
6. 45/13: Make sure that no line break occurs between sign and value, and between value and unit, see also 46/13.
7. 46/26: "-13%" of what? Make sure that the reader always knows what the reference is.
8. 53/19-23: "2002b" should be listed before "2002c".
9. Page 59, caption: Gauss et al. (2005) is not in references list.
10. Page 59, Table row 1: include all units.
11. Page 59, footnote 1: Display in separate column.
12. Page 59, footnote 2: The unit is "g".
13. Page 60, Table rows 3-5: Use only 3 digits after the decimal point (as in row 2).
14. Page 16, caption: What is the reference?
15. Page 4, Table: use decimal point as tab stop.
16. Page 63, Table rows 3-5: Use only 1 digit after the decimal point (as in row 2).
17. Page 64, Table rows 3-5: Use only 1 digit after the decimal point (as in row 2).
18. Page 68, Figure: Different curves are hard to distinguish? Is it really necessary to use 4 different scale for the y-axes in the 4 panels.

19. Page 69, Figure: Different curves are hard to distinguish? Is it really necessary to use 4 different scale for the y-axes in the 4 panels.
20. Page 70, Figure: Do not use automatic colour coding. "Zero" should be the same colour. Potentially the reader can see more if discrete colour steps are used. (Note that colour reproduction depends on computer and printed, which is particular important for the online version of ACP.) Add units to the colour bars. What do the black contours denote?
21. Page 71, Figure: Comment above applies.

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Interactive comment on Atmos. Chem. Phys. Discuss., 6, 10733, 2006.

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