

Interactive comment on “Do supersonic aircraft avoid contrails?” by A. Stenke et al.

Anonymous Referee #2

Received and published: 12 October 2007

General comments

In improving understanding of contrail formation and radiative impacts, the paper addresses an important and timely issue. The techniques and approach are appropriate for an evaluation of this kind and the discussion is good. The narrow focus on contrail formation provides for a thorough analysis, but the context for this is not well-established in the introduction. There is also little air industry context provided. The authors do not comment on whether the introduction of a substantial supersonic fleet is a realistic proposition in the timescale described. More discussion of the developed traffic forecasts and the growth assumptions made would be beneficial. These concerns could be easily addressed. Overall, I feel the paper is a valuable contribution to current knowledge.

Specific comments

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

The current form of the paper feels a little lacking in wider context as the relative climate impacts of the subsonic and supersonic fleet are not given the necessary discussion until the conclusions.

Some discussion of the impacts on cirrus cloud formed from spreading contrail should be provided, both in the Introduction and in the analysis. Currently the Introduction is particularly vague on this issue (12929:18-19). While the uncertainties are important and should be acknowledged, some effort should be made to describe current knowledge, including the range of estimates for radiative forcing from TRADEOFF, which are cited for contrail but apparently overlooked for cirrus cloud impacts. Including fuel in table 3 is potentially misleading, as it raises the expectation that CO₂ radiative forcing is also addressed. It would help to emphasise in the column headings that the radiative forcing applies to linear contrail only. Explanation of the route calculations is required to clarify the differences between scenarios. In particular, the difference between the traffic scenarios presented here and those presented by NASA requires further explanation (12938:12). Do the differences arise from different assumptions on passenger growth, aircraft technology, airspace technology or from something else?

Some mention should also be made of the induced travel effects relating to reducing journey time. This affects the assumption that revenue passenger km would be the same for both the mixed and subsonic fleets (12944:5).

Figures 1,3 and 4 are too small in the current document format and should made be larger in a print version of the paper.

Technical corrections

12928: 13 Word order. Suggest "Only in winter is the northern extratropical stratosphere cold enough for the formation of contrails." Or "The northern extratropical stratosphere is too warm for the formation of contrails for much of the year".

12928: 16 Delete "respectively"

12929:24-27. Confusing. Suggest "Therefore, changes in air traffic density, engine technology, global climate and cruise altitude may all lead to changes in contrail formation.

12932:1 Replace "to use" with "the use of"

12932:11 Replace "are" with "is"

12932:13 Replace "widespread" with "spreading"?

12932:25-28 Sentence confusing. Consider replacing "contrails which" with "contrails. This"

12933:4 Replace "deviation to" with "deviation from"

12933:19 Missing from reference list: Marizy et al.

12933:23-24 Replace "on 2025 only few supersonic" with "by 2025 only a few supersonic"

12934:18 Delete "respectively"

12934:29 Delete "dive"

12935:23 Replace "shown results" with "results shown"

12936:26 Delete "respective"

12936:28 Delete "respectively"

12937:13 Replace "additionally small contrail coverage" with "additionally a small amount of contrail"

12939:7 Replace "positive" with "positively"

12939:8 Replace "negative" with "negatively"

12939:10 Replace "is contributing negative" with "contributes negatively"

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

12940:25 Replace "a remarkably different air traffic distribution in both air traffic inventories" with "remarkable differences in air traffic distribution between the inventories". Clarify how these differences arise.

12940: 29 Clarify what is meant by "mean contrail net RF per contrail coverage"

12941:27 Replace "Particularly" with "In particular,"

12944:3 Replace "In case" with "In the case"

12944:8 Replace "Less contrails" with "Fewer contrails" or "Less contrail coverage"

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 12927, 2007.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper