**Atmospheric
Chemistry
and Physics
Discussions**

Interactive comment on "Comparison of global 3-D aviation emissions datasets" *by* S. C. Olsen et al.

Anonymous Referee #1

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This paper describes a number of aircraft emission datasets, which have been widely used by the scientific community, especially in global 3D atmospheric models, to calculate the environmental impacts of civil (in some cases also military) aviation. The description of the datasets is very brief, while the main focus of the paper is on differences between them.

My only concern with this paper was already risen in my 'quick report', i.e. the question if a rather brief comparison of emission data sets is really worth a peer-reviewed ACP publication. The fact that these emission data sets differ is well-known in the community, and there are no substantial new concepts, ideas, methods or data in this study.

On the other hand we don't publish only for ourselves, and the paper might serve as a convenient reference when conveying uncertainty messages to our potential audience

(policy, industry, ...). To my knowledge this is the first paper quantifying the differences between all these datasets at least in some detail.

Apart from my more fundamental concern, the paper is very well written. The issue of aircraft emissions and their impacts is well introduced, with sufficient (and not too much) detail, the chapters are well balanced and the figures are illustrative. Thus there is not really that much to correct or add.

The Conclusions section is probably the weakest part of the paper (although it is not particularly weak). At least it should start by summarizing very briefly (2 sentences?) what has been done in this study, keeping in mind that some people only read abstract and conclusions. The second paragraph ('Military aviation ...) is good, but the first paragraph omits some important messages. It could, e.g. mention that there are also differences in terms of horizontal distribution as described on page 16897. Also the differences in resolution that were discussed in section 3.2 deserve some mentioning. It was, e.g., interesting to read about the implications this might have for modelling and model results.

I recommend this paper for publication in ACP after the Conclusions section has been improved and the following minor changes have been made:

page 16886, line 21: 'lower' -> 'smaller'

page 16887, line 26: write 'impact of aircraft emissions (per kg emitted) is larger than'

page 16888, line 29: maybe put the long name in parentheses and take the acronym out? I.e. QUANTIFY (Quantifying ...)

page 16888, line 28 - page 16889, line 3: a bullet list of the five emission datasets would make all this easier to absorb

page 16889, line 4: 'not necessarily' -> 'not always'? And: 'these databases' - do you refer to future emissions mentioned in the previous sentence or aviation emission datasets in general?

page 16890, line 24: remove 'an' or replace 'models' by 'model'

page 16891, line 8: 'each of these is' -> 'each of these are' or 'each of these uncertainties are'

page 16891, line 27: it might be helpful to define the term 'general aviation' (either here or when the term first occurs), some readers may think 'general aviation' also includes scheduled flights

page 16892, line 2: remove 'model'

page 16892, line 5: maybe one should add that 610 m was chosen because it better coincides with flighlevels (2000 ft) than, e.g., 500 m!

page 16892, line 7: 'does' -> 'do'

page 16894, line 13: 'The commercial fuelburn ... correspond ...' -> 'The change in commercial fuelburn ... corresponds ...', and: percentage changes would be more interesting than absolute changes!

page 16895, line 4: 'Fig. 5' -> 'Fig. 4'

page 16895, line 7: 'cover' -> 'covers'

page 16896, line 4: remove '(not shown)' (repetition)

page 16897, line 9: 'resolve individual flight tracks not gridded emissions data' - rephrase

page 16897, line 15: 'Fig. 6' -> 'Fig. 5'

page 16898, line 23-27: this sentence is not good (too many whiles, whereases, ands, and parentheses, and also different tenses). Maybe split into two sentences?

page 16899, line 12: 'these data'

page 16900, line 14: 'dataset has'

page 16908, footnote d: '0.600' -> '0.0006'

Fig.11 caption: strictly speaking, 'data' is plural...

Fig.12: figure could probably be enlarged by cropping white margins?

Figs.13 and 14: use colors that are more different, on some printers the blue and greenish colors turn out very similar.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 16885, 2012.