

Interactive comment on “Analysis of emission data from global commercial aviation: 2004 and 2006” by J. T. Wilkerson et al.

Responses to Anonymous Referee #1

Referee’s comments are included below with author responses following each comment.

I found this to be a very comprehensive and clearly written paper on a topic of importance.

The data base on which this paper is based is clearly impressive and the data processing both impressive and clearly stated. I have a couple of questions that might be explicitly addressed in the text, but basically I judge this to be a paper that merits publication with little alteration.

1. in paragraph 3 on page 2947 it is made clear that this paper covers commercial aviation and does not include military flights. It apparently includes “every flight within radar coverage. . . every flight that files a flight plan” (p. 2948), etc. For those (like me) who are unfamiliar with the language of aviation, how does this capture small, private planes? I suggest a sentence on page 2947 or 2948 to make this absolutely clear.

General aviation is also not reported, so have included it in the following sentence:

“We do not examine general aviation or military aircraft emissions because such emissions are generally not reported or reported separately and not provided. It is estimated that the military contribution is in the range of 10-13 percent of total emissions (Eyers et al., 2004; Waitz et al., 2005)”.

2. It appears to me that measures of CO₂ emissions are always in units of mass of carbon. This is sometimes expressed as “(CO₂-C)” but oftentimes numbers are given (see, for example page 2955, line 25) where it says only kg/km². I suggest that it would be worth being very clear out front what “CO₂-C” means and that measures are always in mass C.

Made explicit in every case

3. page 2950, line 15, the word “the” is out of place and needs to be deleted.

Done

4. Page 2954, line 3, “within the terminal control area of airports”. Are we talking about planes in holding patterns waiting to land?

Have clarified the text with the following which indicates both that a TCA is an official description and briefly describes what it is:

“Kettunen further found that 70 percent of the underestimation occurred within the terminal control areas (TCA) which is the volume of space immediately surrounding airports where planes are taking off and landing”.

5. Page 2956, lines 3-7, gasses like CO₂ leak into the southern hemisphere over something like 18 months so there is not really an excess build-up in the northern hemisphere, just a lag time during which mixing occurs.

Have clarified this in the text as follows:

“Weather circulation patterns in the lower latitudes do not often exchange between the Northern and Southern Hemispheres, and winds in the mid latitudes are typically strong and spread emissions in this region quickly (Zhao and Li, 2006)”.

6. Page 2956, line 11, the words “associated and” are transposed.

Done

7. Page 2959, line 25, can we get a brief explanation of why there should be an over-count?

The paper now includes better description of the over-count. More data is now available which enables us to include more information, but it is not possible to completely quantify at this time.

Paper now includes correction values for 2004 data. Moved discussion of over-count toward the beginning to better address it. Included new section 3.1.2 which details the over-count better and describes the corrected value for 2004 data.

8. Page 2960, line 25, “ethene” should apparently be ethylene.

Done

Bottom line: I thought that this was a nice piece of work.