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Interactive comment on “Reassessment of MIPAS age of air trends and variability” by F. J. Haenel et al.

Anonymous Referee #2

Received and published: 18 June 2015

General comments

This paper discusses revised SF₆ measurements from the MIPAS instrument and the mean age of air derived from those measurements. The most prominent change in the mean ages compared to the previous version of SF₆ is the removal of an unphysical minimum in mean age in the tropical middle stratosphere. The removal of this feature also changes the sign of the trend in the tropical middle stratosphere from positive to negative in the new version. This is a significant change and the more realistic distribution of mean age gives some confidence that this change is robust.

Overall, the work done to improve the MIPAS SF₆ dataset described in this paper is substantial and of great benefit to the atmospheric science community. My only issue

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with this paper is the similarity in some of the discussion and figures to Stiller et al., 2012. I realize that this paper is an update of the work in that paper but the emphasis should be on the substantial differences between the new and old versions of SF6 and mean age. Some of the figures in the current paper don't seem different enough to be shown again here, in particular Figs. 3, 6, 8 and 11. Removing those figures and some of the discussion of them would shorten and better focus the paper on the important points.

I recommend the paper be published with some figures and discussion removed as suggested above and consideration of the following specific comments.

Specific comments

Pg. 14687, line 7: remove "however,"

Pg. 14689, lines 2-25: These two paragraphs could be cut down to a couple of sentences. All of the details on MIPAS and ENVISAT have been published previously and can be referenced, such as Fischer et al., 2008.

Figure 1: It's really hard to see any of the features described in the text on this figure. The lines are too small and the colors are too faint. There are also way too many unnecessary molecules listed in the legend on the right side since you can only see about three of them on the figure. The scale needs to be expanded, lines need to be thickened, colors made brighter and most of the molecules removed except those discussed in Section 3.

Pg. 14694, line 2: change to "ozone does not contribute much to the signal in the microwindow..."

Pg. 14695, lines 12-13: change to "This allowed more information from higher altitudes..."

Pg. 14695, lines 21-22: change to "... (upper panels) and the previous setup (lower panels)."

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Pg. 14695, line 25: change “fitted” to “fit”

Pg. 14696, line 2: change “could be” to “was”

Pg. 14696, line 4: change “happened to disappear” with “was removed”

Pg. 14696, line 26: What do the numbers 4-6, 7-10 and 12-18 represent? The vertical resolution in km in the previous and current version of SF6? Need to be more specific.

Pg. 14699, lines 1 and 27: change “more” to “longer”

Section 5.2: This section could be shortened considerably with the focus on just the differences from the previous version. Could combine Sections 5.2 and 5.3.

Pg. 14710, line 4: remove “do”

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 14685, 2015.

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