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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Assessment of upper tropospheric and stratospheric water vapour and ozone in reanalyses as part of S-RIP" *by* Sean M. Davis et al.

Sean M. Davis et al.

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Below is our response to reviewer #1. Reviewer comments are in quotes, and our replies are inline below each reviewer comment

Review of Davis et al. "This paper is comprehensive and well written. It provides a lot of information on the ozone and water vapour fields in various state-of-the-art reanalyses, including quantification of their accuracy, usefulness of the datasets, and possible improvements. As such, I expect this paper to be useful to the atmospheric sciences community, and likely to be highly cited. I recommend publication in ACP subject to the authors paying attention to the specific comments below."

We thank the reviewer for their comments, and indeed hope that this work will be a useful resource for the community.

Specific comments

"P. 3, L. 7: I suggest you indicate here what you will discuss in each section."

Done, at the end of section 1.

"P. 4 L. 16: Do you need "notable"?"

We removed this word.

"L. 27: It would be helpful to the reader to identify the old and updated forecast model and data assimilation system."

We've added some information on the new and old systems to the sentence. Also, the details of the differences between CFSR and earlier NCEP reanalyses are discussed in Saha et al. 2010, and we've now made this more clear in the sentence.

"P. 10 L. 71: was -> were. "

Done

"P. 27 L. 17: Maybe I am wrong, but I understood that there was a debate on the sign of trends in stratospheric water vapour during the late 1990s and early 2000s, with discrepancies between balloon and satellite measurements. Perhaps this has been resolved. Maybe the authors could mention this when they mention the work of Randel et al. (2006)."

As the reviewer notes, there is a discrepancy between decadal trend estimates from balloon measurements and those from satellites. However, the Randel et al. 2006 paper and the text in question by the reviewer are referring to the drop in water vapor around the year 2000, and the measurements from both balloon and satellites are broadly in agreement on the existence of this drop. We have intentionally chosen to

not include reanalysis trends in WV or O3 in this paper.

“P. 41 Table 1: If you are using US spelling, it should be “analyzed”. Same elsewhere.”

Done. The entire document is now in US spelling.

“P. 43 Fig. 1: What do the colours represent? Same for Fig. 2.”

The colors denote the reanalyses. We have made this clearer by coloring the reanalysis text labels with the corresponding color.

“P. 45 Fig. 3: It would be helpful if the authors could identify in the caption what the red/blue colours indicate, e.g., positive/negative values. Same for other figures.”

Done

“P. 47 Fig. 5: It would be helpful if the authors identified in the caption the colours referring to the reanalyses. Same for Fig. 6, 13, 14.”

The captions are already quite verbose, and we don’t think it is necessary to do this since in all of these figures a legend is given showing the reanalyses and their colors.

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