

Interactive comment on “Quantifying tracer transport in the tropical lower stratosphere using WACCM” by M. Abalos et al.

Anonymous Referee #1

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This paper is a follow up to Abalos et al. (2012) that contained an analysis of the seasonal cycles of temperature, ozone and CO based on observations. In this study the authors perform a similar analysis using WACCM output from six years spanning most of the MLS satellite record. The results largely confirm the previous study and lend some interesting insight into the tracer budgets in the tropical lower stratosphere in the model. This study is appropriate for ACP and I suggest publication with consideration of the comments below.

Specific comments:

Pg. 13250, lines 8-10: Any idea how significant the remapping from Lagrangian to Eulerian framework is to the tracer budgets?

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Pg. 13251, line 12: Any significance to the offset in CO above 70 hPa to the analysis that follows?

Pg. 13251, line 22: Sawblade shape to the CO seasonal cycle in MLS isn't captured in the model. Any explanation, significance?

Pg. 13251, line 25: It doesn't seem like Figure 3 belongs in this section, or maybe the section needs to be renamed. There is no “comparison of WACCM with observations” in this figure, it's only WACCM output. This figure is also somewhat redundant with Figure 2, at least the WACCM part.

Pg. 13254, line 20: Figure 7 is really nice. Lots of details in there that could be described further, but only if room to do so.

Pg. 13259, lines 10-13: How do you think the shift in peak vertical level of the annual cycle in ozone shown in Figure 4 might affect the profiles in Figure 11? If the peak annual cycle amplitude shifted down from 70 to 80 hPa as in the observations there might not be as clear a separation in the horizontal vs. vertical contributions to the annual cycle. Might be worth mentioning here.

Pg. 13262, line 1: Replace “Eddy transports are” with “Eddy transport is” and replace “have” with “has”.

Pg. 13262, line 9: An extra “in” should be removed.

Pg. 13262, line 26: Add “to” between “close” and “the”.

Pg. 13263, line 5: Switch the order of the words “also” and “be”.

Pg. 13264, line 6: Replace the first “CO” in the line with “ozone”.

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