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Interactive comment on “Evaluation of near-tropopause ozone distributions in the Global Modeling Initiative combined stratosphere/troposphere model with ozonesonde data” by D. B. Considine et al.

D. B. Considine et al.

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General Comments:

We would like to thank the referee for the time spent reviewing this paper. The comments of all the referees have been very useful, and have helped us to produce an improved revised version which will be submitted to the journal shortly.

We have responded to most of the comments and suggestions included in the reviews, though some of the suggested modifications and additions were infeasible at this time. Below we list in italics the comments of Referee 4 to which we have responded, fol-

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lowed by our response in regular font.

Specific Comments:

"Page 1596, line 26: add "thermal" before "tropopause" as a reminder of the tropopause definition that is being used here."

Done.

"Section 4.2: Are the observed tropopause heights used here based on the regridded (35 level) ozonesonde climatology? How is the thermal tropopause definition then applied? Is the ozone comparison in section 4.3 then performed with mean ozone in the level at which the tropopause is found? Some clarification of the technique used is necessary here."

The observed tropopause heights are not based on the regridded ozone climatology. The tropopause height was calculated for each sonde included in the climatology using the WMO definition of thermal tropopause. Those tropopause heights were then used to calculate the monthly mean and median values shown in Figure 4. Tropopause ozone values for each sonde were those values measured at the location of the thermal tropopause height. We have revised our discussion in this section to clarify things better.

"Page 1599, line 26: While I would agree that vertical resolution is the most likely source of the high bias here, what contribution might tropospheric processes (convection, chemical formation) make to this bias?"

We tested the effects of convection on our results by conducting a model simulation with convective transport turned off. This only increased tropopause O₃ by a small amount (less than 5% at extratropical latitudes, and up to 10% in the tropics). Thus we do not expect realistic changes in convection to significantly reduce the model high bias. In the revised paper, we now mention this test in the last paragraph of this section.

"Page 1607, line 21: How do the model RTT-averaged profiles compare? This panel

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has been omitted from Fig 17."

The panel was added to the figure and discussion modified appropriately.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 1589, 2008.

ACPD

8, S1490–S1492, 2008

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