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8, S8360–S8361, 2008

Interactive Comment

Interactive comment on "Interannual-to-decadal variability of the stratosphere during the 20th century: ensemble simulations with a chemistry-climate model" *by* A. M. Fischer et al.

A. M. Fischer et al.

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1.) The reviewer criticized the lack of evidence that the internal variability in the polar NH is largest. We agree that the plots presented in the first version of the manuscript do not provide sufficient evidence to support this statement since the strength of the polar vortex (PVS) is only shown for the NH. We have compared the PVS in the SH in a similar way as in the NH and compared it to ERA40 reanalyses. The reviewer was right in questioning this issue since indeed SOCOL shows a large internal variability also in the SH which is as large as the observed interannual variability. We have modified the manuscript accordingly and added two sentences in section 3.2 when describing figure 10. However, we have decided against providing a complete discussion of internal variability in the polar SH (i.e. providing plots of SH PVS variability and major warmings),



since such an expanded discussion would significantly extend the paper and would be better suited for a separate publication.

2.) We acknowledge that the reasons for restricting the ozone mass fixer to 40°S-40°N were not very well motivated. We have added two sections to the manuscript: one providing more motivational background for choosing this option (see section 2.1) and one explaining the effects on the seasonal cycle of total ozone (see section 3.1), as criticized by the reviewer.

3.) Concerning the term "modeled EPz" we were referring to the ensemble mean simulation. We have added this necessary information to the text. The ensemble mean filters out some of the ensemble variability leading to a negative bias; it was questioned by the reviewer whether it is still consistent with figure 13. We agree that this might sound contradictory at first sight. We have therefore added a sentence regarding this issue.

4.) The analysis of RMC included calculations of the Transformed Eulerian Mean equations as well as the tape recorder signal. We expanded this section to clarify our analysis.

5.) All minor points (typos, clarifications) have been checked and corrected.

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Interactive Comment

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