

Interactive comment on “On the attribution of stratospheric ozone and temperature changes to changes in ozone-depleting substances and well-mixed greenhouse gases” by T. G. Shepherd and A. I. Jonsson

Anonymous Referee #3

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This paper discusses the attribution of temperature and ozone changes in the past and future climates. The novel idea introduced is that temperature changes cannot be attributed between carbon dioxide and ozone changes, because the latter is temperature dependent and is an internal property of the atmosphere, not a forcing agent like carbon dioxide. Moreover, it is critical to have a correct attribution mechanism in view of expected ozone recovery in the next several decades.

I think the manuscript is well and clearly written and I have only minor comments/suggestions for the authors to consider before publication in ACP.

1. The authors state clearly that they ignore the role of heterogeneous chemistry. It is not clear to me why that is necessary. Wouldn't that be part of the ODS contribution anyways? I realize that they may end up using a different proxy for ODS, but again, why not? 2. Is solar variability included in the model runs that are used for the attribution? The period examined for the past includes about two solar cycles: if solar variability is included, how is that factored in the ozone figures (fig. 4a)? Or is the assumption that the average of such a period cancels out any effect of the solar variability? How dependent are these results on suggested changes (from observations) in the solar constant that models typically use? 3. Figure 4. The x-axis is labeled "Mixing ratio [%/decade]" It is not clear if the units are pure mixing ratios (as in ppmv) or in %/decade.

Interactive comment on Atmos. Chem. Phys. Discuss., 7, 12327, 2007.

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