

Interactive comment on “Nighttime Mesospheric Ozone During the 2002 Southern Hemispheric Major Stratospheric Warming” by Christine Smith-Johnsen et al.

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This is an interesting paper and it is good to revisit this particular event which was, and still is, quite unusual. My main comment is that I think they could and should do a bit more to validate their model. One paper that is probably of relevance is that of Coy et al., (2005) "Modeling the 2002 minor warming event", [GRL, L 07808, doi: 10.1029/2005GL022400]. That presented what, to my knowledge, remains the only simulation of the mesospheric response to the SH 2002 warming. I think this should be cited. Admittedly, they covered the minor warming precursor in August, not the major event in September. This is because SABER yawed away from the SH and did not observe the major event. Nonetheless, the August period is covered by the present

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authors' simulations and figures. For reference, I have attached Figure 3 from the Coy paper. Note that Coy et al show the vertical structure of the event up to the upper mesosphere. I suggest it would be useful for a similar analysis to be done here to help validate their modeled mesospheric response.

My other question concerns the hydrogen. They refer to a climatology in their figure. Is this climatology from WACCM itself? Because SABER did measure hydrogen during the August event. A paper by Mlynchak et al, JGR, 2014 documents the SABER H product. I believe this is an underutilized dataset and the present paper offers an ideal opportunity to compare their model with data.

Finally, and I'm sure they've noticed already, but somebody misspelled stratospheric in their title. (start) It seems correct on the PDF, but incorrect on the web site.

[Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-758, 2016.](#)

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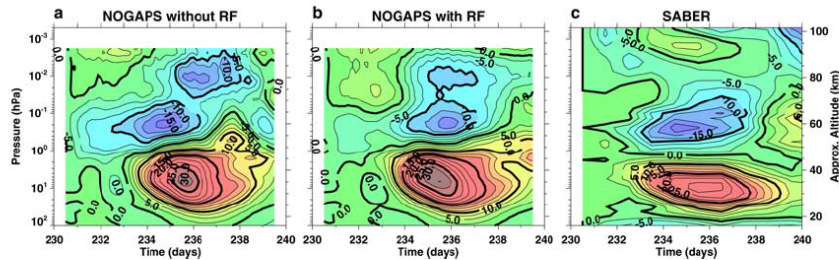


Figure 3. Zonal mean temperature changes (K) at 80°S as a function of time (18–28 August 2002) and pressure for a) NOGAPS-ALPHA 5-day forecast without RF, b) NOGAPS-ALPHA 5-day forecast with RF, and c) SABER observations. The contour interval is 2.5K. The NOGAPS-ALPHA forecasts have been smoothed with time using a 12 hr boxcar average and are not plotted at the beginning and end. Daily averaged SABER observations are plotted at 12 UTC.

Fig. 1.

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