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Interactive comment on "Impact of the 2009 major stratospheric sudden warming on the composition of the stratosphere" *by* M. Tao et al.

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Thanks a lot for your comments.

It is definitely a good potential to compare the model result with Lidar and GBMS measurements close to the edge of north polar vortex (Di Biagio et al. 2010) in terms of quantification of mixing and advection etc. However, the lower to middle stratosphere (450 K -700 K) is the main concern of our study that is lower than the altitudes of main interests in this publication (Di Biagio et al. 2010) .

Moreover, it would be also interesting to use the lidar measurement to clarify how much the MLS averaging kernels impact on the retrieval of N2O and O3, which was discussed in the appendix in our study. So far we used the ACE tracer profiles to compare with

MLS and our model result. One difficulty would be that the vertical resolution of the GBMS is 6-8 km that is even lower than MLS and ACE observations. Never the less, that would also be interesting to compare these measurements with CLaMS tracer profiles.

Last but not least, the descent rate in our simulation is consistent with the diabatic heat rate of ECMWF interim data set, whose anomaly is shown in Figure 2 (d). And we added in the some discussion about the anomalous mesospheric descent pointed out by Orsolini et al. (2010). It can be found in the 2nd Page Line 40-43 in the revised manuscript.

References

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