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Reply on RC1

Gunter Stober et al.

Author comment on "Interhemispheric differences of mesosphere–lower thermosphere winds and tides investigated from three whole-atmosphere models and meteor radar observations" by Gunter Stober et al., Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2021-142-AC1>, 2021

We thank the reviewer for his comments on the paper. We will revise the paper in some paragraphs to put more emphasis on some aspects that are mentioned in the general comment. We are going to include some sentences pointing at the difference between the meteorological analysis NAVGEM-HA and the comprehensive GCMs (WACCM-X(SD), GAIA, and ICON) that were analyzed in this study. The NAVGEM-HA meteorological data shows a good agreement mainly due to the 4DVAR data assimilation up to the mesosphere, which is not comparable to the nudging of the comprehensive models such as WACCM-X(SD) and GAIA with reanalysis data up to the stratosphere. Our study confirms that the climatological fields at the mesosphere are more or less the result of the model physics rather than affected by the nudging.

WACCM-X(SD) is nudged to MERRA reanalysis fields every 3 hours with a soft forcing and a time scale of up to 50 hours. However, it has to be noted that the 3DVAR data assimilation in MERRA2 has a cadence of 6 hours, although MERRA2 provides data fields every 3 hours.

We revised all figures according to the reviewer's suggestions and shifted the time axis for all southern latitude systems by half a year. We added labeled contours for the tidal amplitude plots and also contour lines in the phase plots.

We expect at least some symmetry between both hemispheres due to the residual circulation between the summer and winter poles.