

**Author's response on "On the evaluation of the phase relation between temperature and wind tides based on ground-based measurements and reanalysis data in the middle atmosphere" by Kathrin Baumgarten and Gunter Stober.**

**Anonymous Referee #1**

This manuscript describes temperature tides and their connection to the wind behaviour in the middle atmosphere using ground-based observation and reanalysis MERRA 2. Authors give very clear and useful results. I have only two minor question which should be implemented into discussion part and I can recommend this paper for publication.

*We thank the reviewer for the comments. Answers are given below in italics.*

1) MERRA 2 provide 3 hourly data up to 0.1 hPa. For diurnal and semidiurnal tides is should be ok. But I am not sure if for the terdiurnal tide especially at higher altitudes MERRA 2 data are reliable for this kind of studies. It should be at least mentioned in the paper.

*We agree to the raised comment. MERRA-2 data resolution limites the representation of the terdiurnal tidal component in the results, while the lidar data resolution is better. We have mentioned this in the paper in conclusions (P18L15-16).*

2) I suppose that data from lidar observations is included into MERRA 2 reanalysis assimilation process. Could it affect the results or not? Especially if you show the comparison between MERRA 2 and lidar observation

*MERRA-2 mainly assimilates data from satellites. A list of instruments that enter the data assimilation can be found in Gelaro et al., 2017, JCLI. There is no data assimilated from the Kborn lidar system used in this study. Definitely assimilated measurements are not suitable to provide an independent cross comparison to the model state vectors (temperature, winds).*