

Authors' response to final revisions on acp-2021-981: "Radar observations of winds, waves and tides in the mesosphere and lower thermosphere over South Georgia Island (54°S, 36°W) and comparison to WACCM simulations."

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We would once again like to thank the reviewers for their time and careful consideration of our manuscript, their helpful comments and suggestions have greatly improved this work.

Response to Reviewer #1

Accept subject to technical corrections:

- *Re: Sub volume GWs (line 468-479): It is worthwhile to comment why N and E "sub-variances" weren't done (presumably one reason is the shortage of meteors in the near-North and near-East directions.)*

We have added a short note in the discussion section describing why the directional sub-variances were not included in the final manuscript. As discussed in our first response, low daily meteor counts are indeed a problem but this was not the main problem for our approach (we only considered rolling monthly time windows). The main reason we removed the analysis was because of the strong summertime zonal wind shear in the MLT which, when combined with error in the meteor height determination, can lead to increased error in the subtraction of the local background wind from the radial velocity of each meteor. This leads to an artificial increase in the apparent variance of these perturbations in the zonal direction during summer that we might wrongly attribute to GWs orientated in the zonal direction. Or rather, we cannot currently separate the two causes of increased variance with confidence.

In theory, the method should work well throughout the rest of the year, but we have included the note in the discussion describing this issue for residual perturbations in the zonal direction during summer.

- *Figure 7: The headers for the top two panels are obscured by the heavy red. The bottom (ERA5) headers are almost unreadable in light blue; as are the blue graphs.*

Fixed, thanks. The headers are now white with a black outline, and the light blue has been changed to orange.

- *Line 607: "... that strong modulate ..."?*

Fixed, thanks.

- *Line 654-5 looks like a "reminder" note to the author ?*

Fixed. Thank you for catching this, this was indeed a direct reminder of one of the reviewers suggestions!

Response to Reviewer #2

No suggested revisions, accept as is.

Response to Reviewer #3

No suggested revisions, accept as is.