Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2020-7-AC1, 2020

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Lagrangian Gravity Wave spectra in the lower stratosphere of current (re)analyses" *by* Aurélien Podglajen et al.

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Received and published: 9 June 2020

Reply to Corwin Wright

We would like to thank Corwin Wright for his careful review and insightful comments on our paper. Please find below our point by point reply.

1. ***Reviewer*** — The paper is very clearly written, in particular with a very high standard of written scientific English, and I see no critical scientific deficiencies. I have listed a few minor issues below, but none of these are critical, and I would support publication with at most minor changes. 1. The authors mention JRA-55 a couple of times early on, but then rapidly remove it from consideration due to time-sampling issues. However, I don't think they actually use these data any-

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Discussion paper

where significant in the paper. For clarity I think it would be best to just remove JRA-55 and mentions thereof from the paper completely. This is particularly a problem for the abstract, as it is potentially misleading for someone looking for an assessment of this model specifically.

Authors — We agree that it is misleading to mention JRA-55 in the abstract, because we were unable to evaluate its intrinsic frequency spectrum. However, we find it worth showing that the general behavior of this renalaysis is similar to the others in terms of spatial variability (Figures 5 and 6), and also that the Lagrangian approach of GW evaluation cannot be applied to that product due to its coarse time sampling. Hence, we removed mentions of JRA-55 in the abstract but chose to keep them in the main body of the paper.

2. ***Reviewer*** — Figure 2b makes the pressure-level differences look bigger than they actually are, so might be worth mentioning that the y-scale is over a narrow range (roughly 0.5km max deviation - for ERA5, which is the highest vertical resolution of those considered, this is only ∼2-3 model levels at these heights)

   Authors — Now mentioned

3. ***Reviewer*** — Figures 3 and 7: the panels on the right-hand side are labelled "PreConcordiasi" but those on the left do not say "VorCore", but "pole" instead. I would suggest labelling the left panels as Vorcore to make it immediately clear.

   Authors — Thank you, we agree. The figures have been changed as suggested.

4. ***Reviewer*** — 4. Figure 3: it is quite hard to see the relationship between the values in right-hand panels due to the thickness of the black line and how much it jumps around on top of the red and blue lines. I would suggest replotting it somehow so that the reader can actually see the coloured lines - maybe make the black lines thinner and reduce the heaviness of the gridlines to compensate visually?

Authors — Thank you for the suggestion, we have adjusted Figure 3, which is more legible now.

5. ***Reviewer*** — 5. P12L31: is this specifically zonal momentum flux?

   Authors — Yes, this is now specified.

6. ***Reviewer*** — Figure 5 uses a jet colour table. This is hard for colourblind readers to read, and also suggests semantic meaning at sharp colour transitions where none is implied by the data. I would strongly suggest changing the colour table used for this figure. Also, some of the maximal regions are out of band on the colour table and plotted in white - it may be useful to truncate the data at these points to avoid this issue.

   Authors — We were not aware of this, thank you for raising that point. The colormap has been changed for Viridis.

   Authors — Typos and grammar mistakes have been corrected, thank you for pointing them out.

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