Atmos. Chem. Phys. Discuss., 15, C13235–C13237, 2016
www.atmos-chem-phys-discuss.net/15/C13235/2016/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Exploring atmospheric blocking with GPS radio occultation observations" *by* L. Brunner et al.

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Received and published: 18 March 2016

We thank the reviewer for the positive assessment and his/her helpful comments on our paper. We have included the comments below. Please find our responses highlighted in bold.

1. ...the size and subdivision of figures requires some additional attention. Most figures are extremely hard to read and the authors should re-evaluate the number of figures per panel. Figure 1 is illegible in its current form. Figure 2 could do with larger labels. Figure 3 would benefit from simplified/bigger legends. Figures 4 to 6 would benefit from larger labels. Most important is to deal with Figure 1.

We carefully accounted for the reviewer's comments. We worked on better readability of all the figures. We split Fig. 1 into two figures, now Fig. 1 and Fig. 2. We enlarged the size of figures, labels, and legends. Please note that the final ACP format will also change to A4 size, helping to better present Fig. 1 and Fig. 2.

2. Minor comments:

   - P35801, top: Around here it would be useful to tell the reader what RO data is used in reanalysis products.
     We included a comment on the use of RO data at page 35803, line 2, which reads: "RO data are of high benefit for improving weather forecasts and atmospheric analyses (note that several weather prediction centers already assimilate RO data) as well as for monitoring atmospheric climate ..."
   - P35801, line 5: "in use" should read "used"
     We think the reviewer refers to page 35802, line 5, where we changed this according to the comment.
   - P35804: "empty grid points" are presumably "bins in which no measurements exist"; do remind the reader if RO data is used in ERA-Interim
     We changed this sentence (page 35804, line 10) to make it more clear to: " This effective resolution has been chosen to minimize the number of bins in which no measurements exist, while ...". We changed the sentence at page 35804, line 20, to: "... and some grid cells with no measurements exist...". We furthermore replaced "grid points" by "grid cells" where appropriate.
   - P35804, line 20: "found" should read "exist"
     We changed this according to the comment.

- P35805: “dense enough” seems a rather arbitrary description; is there an objective metric? (Which pat of Figure 1 reveals this?)

  We thank the reviewer for this input. We did not define a specific metric but compared the magnitude of the geopotential height sampling error and blocking-related geopotential height anomalies (as well as geopotential height standard deviation). To make this more clear, we rewrote this sentence to: “However, the small magnitude of the sampling error (Fig. 1e and 2e) compared to blocking-related anomalies (Fig. 1c and 2c) as well as small standard deviation (Fig. 1d and 2d) underpins that RO data sampling is sufficient to capture atmospheric variability on a daily basis when applying a suitable averaging technique.”

- P35809, line 4: What does “anomalously constant” mean?

  We clarified this and rewrote the sentence to: “The height of the lapse-rate tropopause correlates well with GPH maxima and minima. During the persistent Russian blocking, it stays almost constant (Fig. 6c) compared to its usual variations during unblocked conditions.”

- Conclusions: Present tense sounds better to me. RO events are presumably independent measurements?

  We re-checked general scientific writing standards (e.g., http://www.nature.com/scitable/topicpage/effective-writing-13815989). We found that past tense should be used to describe work that has been done and that present tense should be used for expressing findings and conclusions. We used tenses accordingly in our conclusion section and thus prefer to leave it as is.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 35799, 2015.