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Multidecadal Variations of the Effects of the Quasi-Biennial Oscillation on the Climate System

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Reply to the reviewer's comment

1. Fig. 4: Colours of f, g, h are not changed in the new version though mentioned that it is corrected. If it is difficult to incorporate, I am fine with that.

The colours were in fact changed, but obviously not enough - now the changes are more clear.

2. Page 9, Line 29: It is hard to read the formula. Make it clear.

This is a PDF-conversion issue - I will have carefully check the proof.

3. Supplementary Fig. S1 Caption: correct spelling 'not' with 'note'.

Done.

4. Fig. S3 Caption: Mention about red dot and arrows, what they indicate.

Done.

5. Fig S10-S11 Captions: You could write in those Supplementary figure captions as ' same as Fig S9, but for Sea Surface Temperature', etc. It avoids repetitions.

Done (only Fig. 11, as Fig. S10 is slightly different, though).

6. Table 1: NAO why 0 after 1979, what does it imply?

The value is 0.0003, but since the table lists only 3 digits after the comma, it is 0.000, so this is correct.

7. Page 14, line 20: 'Changes in wave activity diagnostics are debated' - give reference of that work.

The sentence is rephrased.

8. Table 1: PWCJAS during 1979-2015 gave significant results (same signed) for all three different datasets. Mention that interesting results.

9. Also for PWCJAS, all observations are -ve, irrespective of time periods. But model results are mostly positive. If you have any explanation, mention that.

10. Table 1: In observation, almost all the PWCDJF are with positive sign, though -ve for PWCJAS. Do you have any explanation for that?

The three comments belong together. The reviewer is right that this was not emphasized enough, our discussion on this was ultra-short. In the revised text, this section is extended to: „We found a slight, not significant increase in observation-based data during boreal winter. In summer, we find a significantly negative response (weakening Walker circulation during easterlies) during the ERA-Interim period in all data sets (and a response of the same sign – though not significant - in all other subperiods and data sets). In contrast, in the model the Walker circulation is stronger for easterly than for westerly QBO in both seasons (DJF and JAS), in some simulations highly significant. The former is consistent with increased convection over the Pacific warm pool area and is consistent with observations (Fig. 5), whereas the latter is not consistent with increased convection and the sign is different from that found in the observations.“

11. For S3 if possible you could change the colour of significant level to red or any bright colour. It is difficult to recognize in current form.
Not sure which figure is meant. Fig. S3 (and Fig. 3) have no significance indicated, Fig. S5 canont be meant as red colour would completely vanish here.