Review of revised manuscript: "Understanding the Australian monsoon change during the Last Glacial Maximum with multi-model ensemble" by Yan et al.

General comments:

The authors have gone to some effort to address reviewer comments on the manuscript. The revised manuscript now includes a more satisfactory decomposition of the rainfall changes based on Huang et al. (2013) approach using changes in specific humidity and vertical motion. The paper also now addresses the extent to which models agree on changes as well as presenting multi-model mean results.

I therefore recommend publication subject to minor corrections outlined below. (Please note that the manuscript would benefit from further proof-reading as I have not provided an exhaustive list of corrections.)

Specific Comments:

1. Line 27: replace "multi-models' experiments" with "multi-model experiments"

2. Line 34: delete "the" before northern Australia.

3. Line 130: while CMIP5 models have reasonable performance simulating the Australian monsoon precipitation, there are some biases, e.g. some models are much too wet or dry, or fail to simulate the reversal of winds. This is discussed in the Jourdain (2013) and Brown (2016) papers cited here. Please provide a more balanced assessment of model skill in simulating the Australian monsoon.

4. Line 168: Huang et al. (2013) argue that Tadv term can be neglected in the tropics to simplify the analysis. Is there a reason not to neglect this term?

5. Line 183-184: I am not sure what this sentence means. Are you arguing that the exact definition of the monsoon domain is not important for the results? Or that the analysis presented in the rest of the paper does not use this domain?

6. Line 226: "rest terms"? do you mean "the rest of the terms"?

7. Line 229 (Figure S3): Why do the terms not sum to give the total rainfall change? Also, note comment 4 above about neglecting the advection term.

8. Line 298: "Thermal effects" should be "thermodynamic effects" (here and in other places, e.g. lines 324, 414, 415).

9. Line 299: Replace "impact" with "magnitude" (i.e. quantitative comparison).

10. Line 309: Remove brackets?

11. Line 314: Replace "which is consists with our work in this point of view" with "which is also consistent with our work".

12. Line 316: Remind the reader what is shown by the reconstruction of Liu et al. (2015).

13. Line 330-351: This paragraph is a bit confusing. Perhaps remove some of the detail, e.g. lines 338-346. Also it needs careful proof reading for both English and for the scientific content of the discussion. Several different points are being mixed together, and the last two sentences (347-351) seem out of place.

14. Line 331: insert "relative to the present day" after November.

15. Line 334: delete "of" before "the ocean".

16. Line 365: replace "synthesis" with "hypothesis".

17. Line 378: replace "sensitive" with "sensitivity"

18. Line 379: replace "to be" with "are"

19. Line 385: replace "wind filed" with "wind field"

20. Line 395: replace East Pacific… patter" with "eastern Pacific El Nino-like pattern".

21. Lines 414, 415: thermodynamic not thermal

22. Line 425, 431: sensitivity not sensitive

23. Line 440-441: I would argue that this will not "improve model performance", but instead increase confidence in model results or understanding of model-data disagreement. Changes in the model physics, resolution etc. are required to improve model performance – a different matter entirely.