

Interactive comment on “The relationship between intraseasonal tropical variability and ENSO simulated by the CMIP5” by Tatiana Matveeva and Daria Gushchina

Anonymous Referee #2

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Twenty-three CMIP5 models are investigated for their match with observations in representing aspects of tropical intraseasonal and interannual variability. Despite the title, which emphasises the relationship between interannual and intraseasonal variability, the majority of the paper is first spent analysing which models are best at simulating individual aspects of the variability, namely the two types of ENSO, the MJO, and Equatorial Rossby and Kelvin waves. The results show a large variety of behaviour from the models, with very few models showing variability and relationships like observed. This may be of interest to model developers, but I don't think it adds much new insight into the dynamics of the observed variability. Also, I can't see how these results can help pin-point what aspects of the models need to be changed for improvement.

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I understand this is a difficult task, but is one that needs to be done to help improve the models. At the very least I think this paper needs major revision. Some specific comments are as follows (listed in approximate order of appearance, not importance).

1. The English grammar needs improving to make it easier to read and understand. For example, there are many instances where the word “the” is inserted incorrectly or missing.
2. Page 3, line 24: Kim and You (2012) missing from reference list.
3. Page 5, line 6: “PI” is not defined.
4. Section 2.2: It is noteworthy that you are using zonal wind data instead of a proxy for clouds and convective rainfall (e.g. outgoing longwave radiation) as used by Wheeler and Kiladis (1999). This means that the variability highlighted by your wavenumber-frequency analysis (Figure 3) is somewhat different to that highlighted in Wheeler and Kiladis (1999). It also means that the variability you show and isolate is not necessarily ‘convectively-coupled’. For example, Figure 3 indicates the existence of the global Rossby-Haurwitz waves for low westward-propagating wavenumbers and periods around 5 days. It also means that the convectively-coupled equatorial Rossby (ER) and Kelvin waves are much less clear in Figure 3. This means that your filtered fields will also contain a much greater mix of variability compared to Wheeler and Kiladis. Finally, I note that you use rectangles to define your regions of filtering instead of following the dispersion curves for the equatorial waves. Ideally you should change your fields and filtering to better match the characteristics of the waves. However, I support the use of the western Pacific wind indices later in the paper as this is consistent with the findings of Hendon et al. (2007).
5. How are the values in Table 3 calculated?
6. Page 13, lines 13-15. This is poor style for scientific writing. Please refer to this paper: <http://onlinelibrary.wiley.com/doi/10.1029/2010EO450004/full>

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Robock, A. (2010), Parentheses Are (Are Not) for References and Clarification (Saving Space), *Eos Trans. AGU*, 91(45), 419–419, doi:10.1029/2010EO450004.

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