

Comments on “The response of tropical precipitation to Earth’s precession: The role of fluxes and vertical stability” by Jalihal et al.

Effect of astronomical parameters on global monsoon and precipitation is one of the hottest topics, both for the proxy and modeling community. In this study, the authors tried to evaluate the precession effect on the tropical precipitation from a perspective of energy and moisture budget, with a special focus on the differences between land and ocean. It is a useful method and gives new understanding for precession effect. However, the paper in its present form seems a little preliminary and casual, especially its structure. I recommend the manuscript to be major revised before published in *Climate of the Past*. My comments are listed as follows,

(1) The structure of the text seems casual. I recommend that the authors put all the methods (including the ITCZ model, equation and decomposition) together. In the result section, it is better to merely show the figure and descriptions. That would help the paper to be easily read.

(2) Introduction: there are a lot of modeling studies in this field; however, the authors did not mention them in the introduction. For example,

Global:

Kutzbach, J., Liu, X., Liu, Z., Chen, G., 2008. Simulation of the

evolutionary response of global summer monsoons to orbital forcing over the past 280,000 years. *Clim. Dyn.* 30, 567-579.

Asia and Africa:

Tuenter, E., Weber, S., Hilgen, F., Lourens, L., Ganopolski, A., 2005. Simulation of climate phase lags in response to precession and obliquity forcing and the role of vegetation. *Clim. Dynam.* 24, 279-295

Weber, S., Tuenter, E., 2011. The impact of varying ice sheets and greenhouse gases on the intensity and timing of boreal summer monsoons. *Quat. Sci. Rev.* 30, 469-479.

Shi, Z., Liu, X., Cheng, X., 2012. Anti-phased response of northern and southern East Asian summer precipitation to ENSO modulation of orbital forcing. *Quat. Sci. Rev.* 40, 30-38.

Caley, T., Roche, D.M., Renssen, H., 2014. Orbital Asian summer monsoon dynamics revealed using an isotope-enabled global climate model. *Nat. Commun.* 5, 5371. <http://dx.doi.org/10.1038/ncomms6371>.

Shi, Z., 2016. Response of Asian summer monsoon duration to orbital forcing under glacial and interglacial conditions: implication for precipitation variability in geological records. *Quat. Sci. Rev.* 139, 30-42

(3) Experiments: Only two sensitivity runs are conducted in this study.

The authors said the differences between Pmax and Pmin scenarios

“has a similar spatial precipitation response as observed in Mid

Holocene, but with higher amplitude”. In actual, there is certain contribution from obliquity in the MH-PI difference. I know in Bosmans et al (2015), there are already obliquity-linked experiments. Why do the authors not give results for the obliquity in this study? In my opinion, it is also important.

- (4) Results: From figure 5 and 6, I can see the distinct response of land and ocean precipitation, but it is also significantly negative over northwestern Pacific besides the Bay of Bengal. This indicates that the East Asian/Northwestern Pacific summer precipitation is also typical for the proposal of this paper. I recommend the authors to add additional analyses on this region and compare the results to those over the Bay of Bengal.