

Interactive comment on “The East Asian summer monsoon at mid-Holocene: results from PMIP3 simulations” by W. Zheng et al.

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We would like to thank the reviewer for the constructive comments. We will revise the manuscript based on these remarks. Some specific responses are listed below:

1) We agree with the comment regarding the discussion about the differences between PMIP2 and PMIP3 models and will make further analyses for the comparison, and also for model-data comparison in section 3.2.

2) In the comparison between PMIP3 model median and observations, the long term mean of surface air temperature from CRU (1900–2000) and precipitation from CMAP (1979–2000) were used. Part of the model biases results from the lower green house gases concentration in the PI simulations, previous studies suggest the lower green

house concentration would explain about 0.6 °C of the cold bias between the PI simulations and present climate observations (Folland et al. 2001; Trenberth et al. 2007). We will add these references in the revision.

3) The 1-4 °C warming estimated by the proxy data of MH represents the change of annual surface air temperature at mid-Holocene as summarized by Shi et al. (1993), with weaker warming in southern China, about 3°C in northern China and above 4 °C over the Tibetan Plateau. And by the PMIP3 experiment protocols, the MH experiment are set up to examine the climate response to the insolation at 6ka. So it is suitable to compare the model results with the proxy data. The PMIP3 models can reproduce the response to the change of insolation but underestimate the change of annual mean surface air temperature. We suspect that the underestimation is related with the vegetation, but it is not obvious by PMIP2 model studies (e.g. Braconnot et al. 2007; Jiang et al. 2012). We will revisit the model results and rewrite the discussion.

4) The large-scale precipitation pattern is controlled by the vertical velocity and the water vapor content is one of the factor related with the strength of precipitation. Regarding the comments of (7) and (8), we will reorganize and make clearer statements for the model results of EASM precipitation in different regions of China and for the model spread.

5) Other comments will be revised and the references will be double checked in the revision.

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