

Interactive comment on “The LGM surface climate and atmospheric circulation over East Asia and the North Pacific in the PMIP2 coupled model simulations” by W. Yanase and A. Abe-Ouchi

Anonymous Referee #2

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This short paper discussed the LGM simulations of several PMIP2 outputs, with the focus on the East Asia and North Pacific circulation and precipitation in winter and summer. Consistent with previous simulations in AGCM-alone, coupled AGCM-slab ocean, and fully CGCM, it is found that the subtropical high is reduced in summer, while the Aleutian Low is intensified in winter. The summer precipitation is characterized by drying in the East Asia but wet in the eastern North Pacific. The winter precipitation is characterized by a southward shift. Preliminary mechanism study is also preformed on the water budget. Overall, this is a useful paper that documents the state-of-art simulations in CGCMs. The paper is also clearly rewritten and well focused, and represents a significant improvement over a previous version. Therefore, I would recommend it for

publication. However, there are several questions that I hope the authors can clarify before the paper is sent out for publication.

First, all the figures are too small to read, the label, the shading. They really need to be redrawn, especially the contours and labels. Too much shading only confuses the plot more, with such a small figure. So, the shading should be used only for the extremes (positive and negative).

Second, the fact that the CGCM simulations produce roughly the same results as previous AGCM. suggests that the major climatic features in this region is independent of ocean dynamics and its feedback on climate.

Third, the authors tend to explain the responses in summer and winter separately. However, for certain features, it is easier to understand the changes in both seasons from the annual mean change, because of the same sign. This is especially true here since the dominant CO₂ forcing and ice sheet forcing are all annual mean forcing. For example, the negative SLP in both summer and winter over the North Pacific reflects an annual mean negative SLP anomaly, although the mechanism for this annual mean remains to be further explored. The reduced evaporation in both summer and winter over the land and ocean simply reflects a cooler climate and less water vapor holding in the atmosphere. Therefore, they should not be interpreted as a feedback on precipitation. They simply reinforces the transport effect over land but cancels part of the transport effect over the eastern N. Pacific.

Interactive comment on Clim. Past Discuss., 3, 655, 2007.

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