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Climate of the Past Discussions

Interactive comment on "Climate and African precipitation changes in the mid-Holocene simulated using an Earth System Model MIROC-ESM" *by* R. Ohgaito et al.

Anonymous Referee #2

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In this study, Ohgaito et al. performed simulations of time-slice experiments at 0k and 6k with two models, and in some case, even a third model was employed to conduct sensitivity experiments. The climate changes at 6ka in atmosphere, ocean and land surface were well addressed both at global and regional scales. They found that dynamics vegetation and improvements in atmospheric processes do not have significant impacts on representing the 6ka monsoon change suggsted by reconstruction data; changes in African monsoon precipitation may be attributed to SST rather than vegetation coupling.ÂăOverall, it is a very coprehensice study. Although this paper in some sense bears a style of "techinique report", it is still a much-needed work given the fact that many earth system models are involved in CMIP5/PMIP3 for the first time, the per-

formance of ESM compared to its OAGCM version to reproduce the climate changes at 6ka must be of interest to broader climate modelling community. I recommand this paper to be pulished in the journal Climate of the Past. The paper is well-written, only minor modifications are needed.

CommentsÂă: P3287, Fig3. The SST biases in the northern Pacific and Atlantic are much more significant for MIROC-ESM than for MIROC. What is the possible reason? Do these biases have any impact on the climate over the mid-high latitudes?

P3290: Fig10: SST changes for MIROC-ESM is negative over northern high latitudes, which are quite different from the changes for MIROC. The authors claimed that they are unable to state which model is better by the proxy records, but it would be helpful to put these SST changes in the context of PMIP2 simulations, so the readers could get an idea about the likely sign and amplitude of SST changes at 6ka simulated by other OAGCMs. It isn't clear if the large difference in SST between ECM and OAGCM impede the air-sea-land interaction in ESM for Asian monsoon. Please comment on this issue.

Sec. 3.3 and 4.4 describe the distribution of carbon in MIROC-ESM and its change in 6ka. But these aspects have loose connection with the aims of this papers, I don't see them necessary to be included in this study.

P3292 L22-24, Fig14, it's a novel way to interprete the proxy record.

Figures 26&27 look very "noisy". It would be better to suppress the black contour lines.

Interactive comment on Clim. Past Discuss., 8, 3277, 2012.