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Climate of the Past Discussions

Interactive comment on "Understanding the Australian Monsoon change during the Last Glacial Maximum with multi-model ensemble" *by* Mi Yan et al.

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Dear authors, I am surprised that results from several modeling and proxy studies on the LGM climate over the Australian-Indonesian monsoon region are missing. Your inference that the ITCZ did not shift during the LGM is already shown by Mohtadi et al. (2014) using both CCSM3 model and proxy data. However, that study argues that annual rainfall did not change in the western part of the Australian-Indonesian monsoon system during the LGM (but during the Heinrich stadial). Reference: Mohtadi M., Prange M., Oppo D.W., De Pol-Holz R., Merkel U., Zhang X., Steinke S., Lückge A., 2014. North Atlantic forcing of tropical Indian Ocean climate. Nature 509, 76-80.

Further, both the austral summer and winter monsoon changes since the LGM have been reconstructed by Mohtadi et al. (2011), showing that the austral summer monsoon does not show glacial-interglacial variability, and that the LGM was not significantly drier than the other periods, while the austral winter monsoon was as weak as today during the LGM and follows the Northern Hemisphere summer insolation. Reference: Mohtadi M., Oppo D.W., Steinke S., Stuut J-B W., De Pol-Holz R., Hebbeln D., Lückge A., 2011. Glacial to Holocene swings of the Australian-Indonesian monsoon. Nature Geoscience 4, 540-544.

Finally, a recent study suggests that annual mean rainfall during the LGM was even higher than today in the western part of the Australian-Indoneian monsoon system using different proxies and models. Reference: Mohtadi M., Prange M., Schefuß E., Jennerjahn T.C., 2017. Late Holocene Slowdown of the Indian Ocean Walker circulation. Nature Communications 8, doi:10.1038/s41467-017-00855-3.

Finally, additional support for the above inferences is provided by Niedermeyer et al. (2014), showing no difference in LGM rainfall compared to today. Reference: Niedermeyer E.M., Sessions A.L., Feakins S.J., Mohtadi M., 2014. Hydroclimate of the western Indo-Pacific Warm Pool during the past 24,000 years. Proceedings of the National Academy of Science 111, 9402-9406.

I can hardly imagine how the authors have missed these papers, all being published in top-ranked journals, and why the above results are not discussed in this study, as they are of great relevance for both model and proxy evaluations. I look forward to see those results implemented in the discussion section.

Best regards, Mahyar Mohtadi

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