

# ***Interactive comment on “Extratropical cyclones over the North Atlantic and Western Europe during the Last Glacial Maximum and implications for proxy interpretation” by Joaquim G. Pinto and Patrick Ludwig***

## **Anonymous Referee #2**

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This is an interesting paper assessing how cyclone activity differed in parts of the northern hemisphere during the last glacial maximum. The paper is well written and the results are interesting, particularly the cyclone composites from the regional model simulations showing the different cyclone impacts between the two periods.

My major comment is that the ice sheets and sea level change resulted in quite substantial differences in topography, MSLP etc between the two periods, which influences how the tracking scheme functions. I think there would be a great deal of value in using a higher level in the atmosphere (e.g. 500hPa) for identifying cyclones to assess

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how robust the observed changes are. I recognise that this is difficult (due to the time involved) or possibly impossible, depending on what data exists for the global model, but it could provide some useful insights, even just from the WRF simulations.

Minor comments:

L89 - I would appreciate more information on why this specific global model was chosen, especially as you say its large-scale circulation is different from other models. Please also note its spatial resolution.

L119 - does identifying cyclones manually make much difference compared to the tracking scheme used for the GCM cyclones?

L130 - I would appreciate some more evaluation of how the model compares to reanalyses included within this paper.

L173 - please elaborate on how “care was taken” that the tracks align. It would be nice to see some statistics comparing e.g. mean biases in location/intensity, rather than just for a selected cyclone.

Table 3 - In addition (or instead of) these stats for all cyclones, some summary statistics of the top 30 cyclones for each simulation would be helpful. E.g. mean intensity and cyclogenesis latitude from the GCM, or mean wind speed, rain rate, etc from the WRF simulations.

Figure 6 c/d - it would be nice to have an additional panel showing the MSLP field in the GCM

Figure 7 - are the differences in panels c and f between the absolute values or between the anomalies? Given that there is the large mean MSLP difference between the simulations, I think the difference in local anomalies might be more informative for understanding how e.g. pressure gradients differ between simulations.

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Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2019-139>, 2019.