

Interactive comment on “Greenland Ice Sheet influence on Last Interglacial climate: global sensitivity studies performed with an atmosphere–ocean general circulation model” by M. Pfeiffer and G. Lohmann

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Dear A. Born,

thank you very much for your interest in our manuscript, your comments, and for bringing to our attention the two recent and interesting studies (Merz et al., 2014a; 2014b).

Comparing these two published studies with the current one, we note that there are significant differences in the experiment setup, the aim, and as well in the derived results.

C235

Merz et al. (2014a) use, as you already mentioned, high resolution ice sheet models for the reconstruction of the Greenland Ice Sheet (GIS), which is indeed necessary when the focus is on local climate over Greenland. On the other hand, their study considers prescribed sea surface temperatures.

In contrast, our study aims at large scale effects of a reduced GIS. Therefore, we consider the use of a lower resolution atmosphere model and a relatively simplistic representation of the GIS; yet, we couple the atmosphere simulation interactively to a general circulation model of the ocean, which is necessary when the focus is on large scale effects.

Considering our results only for the Greenland region, we find that in one of the experiments with a reduced GIS (LIG-1300m-alb) there is a strong warming over Greenland in both summer and winter seasons. Merz et al. (2014a) describe results that on the other hand show a more mixed signal, with positive temperature anomalies being also accompanied by cooling. A comparison of our results to the study by Merz et al. (2014a) will be included in the revised version of the manuscript.

Kind regards, Madlene Pfeiffer and Gerrit Lohmann

References:

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C236