

Interactive comment on “Sensitivity of atmospheric forcing on Northern Hemisphere ice sheets during the last glacial-interglacial cycle using output from PMIP3” by Lu Niu et al.

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We would like to thank Dr. Irina Rogozhina for the valuable comments on our manuscript. Here is the response to the points raised.

As described in the manuscript in Sect. 2.2 in equation (10), a precipitation correction related to the surface elevation (H) is used. In order to match the relative sea level record, a factor β is used to get a reasonable surface mass balance during the ice sheet evolution process. This precipitation correction is independent on the actual surface melt related to the PDD.

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The elevation correction scheme used for precipitation starts from sea level and affects also high elevation regions, for example the Tibetan Plateau. We think that this effect is one reason for leading to this discrepancy. For region that has higher elevation, the precipitation is reduced more than the other that has lower elevation, which resulted in the limited ice masses in this region.

In order to compensate this discrepancy, we also did experiments in which we added the topography influence at the LGM as what we did for Present day (see Eq. 11). While as a result, we also got extremely large amount of ice sheet volume at the LGM which could not match the sea level record.

Hopefully this explanation answers your question. If you have further questions, we could share the model setup and results and discuss more.

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