

## ***Interactive comment on “Simulation of the last glacial cycle with a coupled climate ice-sheet model of intermediate complexity” by A. Ganopolski et al.***

### **Anonymous Referee #3**

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This is a careful and well written paper on simulations of the coupled ocean-atmosphere-vegetation-cryosphere system (without interactive biogeochemical cycles) over a full glacial cycle. The uncertainties linked to somewhat arbitrarily fixed parameter values and corrections are generally appropriately discussed. The paper is innovative and definitively worth being published in CP with some minor modifications in addition to those suggested by the two other anonymous reviewers.

1) It is not clear why the North American temperature bias should remain constant over a whole glacial cycle. The North American geography undergoes profound changes over glacial-interglacial cycles that could easily change the standing temperature ed-

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dies. What would a similar correction for Eurasia look like? Would it have a similarly strong impact?

2) The references to the two-dimensional energy-balance models (p. 2271) are very old (20 years). What is strange is that the authors write that this approach has been used "until recently".

3) The authors should discuss the implications of the absence of an interactive river routing scheme which could quite significantly alter the outcome of the simulations (as suggested by Alkama and others)

4) "The penetration of meltwater... with sediment-laden flow" -> citation needed

5) The refreezing "parameterization" is really simple. Shouldn't the refreezing fraction depend in some simple way on the melt quantity itself or, in some more detail, on ratio of melt and (solid) precipitation? This would probably lead to a faster simulated ice-sheet decay and less freshwater flow and ice sheet buildup in cold phases.

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Interactive comment on Clim. Past Discuss., 5, 2269, 2009.

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