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Climate of the Past Discussions

Interactive comment on "Comparing transient, accelerated, and equilibrium simulations of the last 30 000 years with the GENIE-1 model" *by* D. J. Lunt et al.

D. J. Lunt et al.

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The main comment raised was the issue of the relevance of this work to other climate models, in particular more complex GCMs. This is a valid point, which we have attempted to address in our revised manuscript. We first comment that Rahmstorf et al. (2005) carry out an intercomparison study of several EMICs, finding that all the 11 climate models tested, including GENIE-1, show a qualitatively similar response to a transient fresh water forcing. This is different to the forcing applied in our study, but at least shows that GENIE-1 has associated typical timescales which are consistent with other EMICs. We add that in a similar study, which included full-complexity GCMs in addition to EMICs, Stouffer et al. (2006) find that the oceanic response to a transient freshwater forcing is very similar in EMICs with a 3-D ocean, as in full-complexity

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GCMs.

A further comment was questioning the dependence of the model results on the relatively low resolution of GENIE-1, and on the (ill-constrained) mixing parameters. To address this point, we have repeated all the simulations with an increased vertical resolution in the ocean, and with a lower diapycnal mixing coefficient (to increase the typical timescale in the ocean). We find that the main results are relatively insensitive to either of these changes.

Additional specific comments are addressed in the letter to the editor, and in our revised manuscript. In particular, we have added a discussion of the sea ice evolution in the simulations, and made a comparison with HadSM3 at the LGM.

Interactive comment on Clim. Past Discuss., 2, 267, 2006.