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**Geoscientific
Model Development
Discussions**

Interactive comment on "Climate forcing reconstructions for use in PMIP simulations of the last millennium (v1.0)" *by* G. A. Schmidt et al.

Anonymous Referee #2

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This paper outlines, in considerable detail, the experimental design proposed for climate simulations of the last millennium as part of PMIP3 (Paleoclimate Modelling Intercomparison Project Phase 3).

The chosen forcings are described as is the rationale for selecting particular reconstructions. As it stands this paper will make a very valuable contribution to PMIP3 and will serve as a point of reference so that in the future it will be easy to refer back to this paper to understand what was chosen and perhaps most importantly why it was chosen. It would be great to see a similar approach adopted across all PMIP3 time intervals for consistency with the last millennium and Pliocene experiments.

I certainly recommend publication of the paper in Geophysical Model Development.

General comments:

The experimental design in some respects follows PMIP traditions by identifying recommended and alternate boundary conditions. However, it also includes a very significant departure from previous phases of PMIP in that even within the recommended experimental design there are a number of options that can be chosen. I think the rationale of this is well made in the paper - it has always been part of PMIPs job description to examine the effects that uncertainty in boundary conditions have on climate model predictions for different intervals of time. That is very important when the time comes to compare model outputs to proxy data. In many respects it is also a pragmatic approach in that it recognises that it is impossible to provide different models with identical forcings even if the same boundary conditions are used due to structural differences within the models themselves (vegetation being a classic example).

Nevertheless from a practical point of view such an approach, whilst laudable, gives me some cause for concern. How many groups will really run the different permutations to test the forcing uncertainty properly across a large enough sample of structurally different models? As far as I know the primary objective of PMIP is to compare models runs for past climates and to do that part of PMIP it seems sensible to try as hard as one can to get the models to run with the same forcings at least in 1 experiment for each time interval. So I agree with reviewer 1, I think it's useful to identify one permutation of the PMIP3 preferred boundary conditions for the last millennium that all groups sign up to and then provide the groups with the option of running further sensitivity tests if time and computing resources allow.

I also agree that a table showing all forcings would be useful and perhaps highlighting the one permutation that groups are encouraged to perform before moving on to other simulations. Other than that this is a great paper by a great collection of scientists and I look forward to seeing it in its final version in GMD.

Interactive comment on Geosci. Model Dev. Discuss., 3, 1549, 2010.