

Interactive comment on “Regional and global climate for the mid-Pliocene using CCSM4 and PlioMIP2 boundary conditions” by Deepak Chandan and W. Richard Peltier

Anonymous Referee #2

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In this paper, based on the PlioMIP2 boundary conditions, the authors use the CCSM4 to simulate the mid-Pliocene warm climate. The experiments are well designed and described in the paper. The paper is well written, and provide very good summaries for the Pliocene studies from aspects of ocean, land-ice reconstructions.

However, in the paper, the authors do not clarify why they choose different diapycnal mixing k to carry out their experiments. In their models outputs, it is clear that the depth-dependent k remarkable changes the simulated ocean climate. Why do the authors only compare the simulated Pliocene and PI climate in the experiments with depth-dependent k ? Do these experiments provide even stronger warming in the high-latitudes? In the revised version, I suggest the authors to plot figures similar to Figure

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6, but based on the experiments with the constant k .

I also suggest the authors to plot AMOC for both two sets of experiments. It is helpful for other groups to judge which k provides better simulations for AMOC.

Since this work is taking part in the PlioMIP2, the authors should provide suggestions for other groups which set of experiments should be used in the future intercomparisons, the set with the constant k or the set with the depth-dependent k . Why?

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