**Geoscientific
Model Development
Discussions**

Interactive comment on "Simulating the mid-Pliocene climate with the MIROC general circulation model: experimental design and initial results" *by* W.-L. Chan et al.

Anonymous Referee #1

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GMD review: Simulating the mid-Pliocene climate with the MIROC general circulation model: Experimental design and initial results

The paper by Chan, Abe-Ouchi and Ohgaito contains a comprehensive description of the MIROC mid-resolution simulation of the mid-Pliocene warm period (ca. 3.2Ma BP). The mid-Pliocene is of great interest to climate scientists because of its potential as an analogue for future climate under increasing CO2 forcing.

The MIROC model performed two simulations following the Pliocene Model Intercomparison Project (PlioMIP) experimental designs for atmosphere-only (AGCM) model simulations (Experiment 1) and fully-coupled atmosphere-ocean GCM simulations (Ex-

C850

periment 2). The authors present a clear description of the MIROC4m (mid-resolution) general circulation model and describe how it was deployed for both the AGCM and AOGCM experiments. They outline the creation of the initial boundary conditions forcings, following PlioMIP protocols for preferred experiments. They present clear, and reasonable summaries of their initial model results.

The paper is clear and well-written, concise yet complete, and requires few editorial revisions. I recommend that this paper be published, with minor revisions, outlined below.

Technical comments:

2023-20: Word choice or sentence structure could be improved: " …. recognize how large the calculated and prescribed SSTs differ."

2015-25: How does the 2 grid gap for the Bering strait compare with the MIROC modern Bering Strait? What effect does it have on your Pliocene simulation for the arctic?

2015-25: "Certain areas of water are represented as isolated basins, such as the Hudson Bay and the Mediterranean Sea" Do your present day simulations treat these areas in the same way? If not, how and why do you treat them differently? What effect does this have on the simulation?

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