

Interactive comment on “Modelling mid-Pliocene climate with COSMOS” by C. Stepanek and G. Lohmann

Anonymous Referee #2

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The manuscript of C. Stepanek and G. Lohmann describes the experimental setup and the essential results of model simulations in the framework of the PlioMIP project. The utilized model system COSMOS comprises the atmospheric model ECHAM5, the land surface and vegetation model JSBACH, and the ocean and sea ice model MPIOM. In total four different runs are presented. In the simpler setup, labeled experiment 1, is the atmosphere-land surface/vegetation exposed to a prescribed SST distribution following the PlioMIP experimental guidelines. In contrast the experiment 2 uses a fully coupled atmosphere-ocean model system. For each setup two model simulations are presented for two different time slices that represent either the preindustrial or the mid-Pliocene state.

The manuscript informs after the introduction about the characteristics of the three

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model components ECHAM5, JSBACH, and MPIOM. The experimental setup of each component describes the applied simplifications and their justifications. It also highlights principal differences between the experimental guidelines and the actual implementations in the model components and how they have been solved. The description of common central climatologically features of the modeled climate states and their distinct differences between the eras and setups are the core of the paper. The focus is here on global averaged integrated energy flux in and out of the system, the atmospheric distributions of the surface air temperature and precipitation. In the ocean the focus is directed onto the surface properties sea surface temperature (SST), sea surface salinity (SSS), and sea ice as well as the meridional overturning. The discussion and conclusions close the manuscript.

The manuscript is overall well structured and is well written. Since the selected journal Geoscientific Model Development (GMD) is “dedicated to the publication and public discussion of the description, development and evaluation of numerical models of the Earth System and its components,” the presented simulations in framework of the PlioMIP project are placed in the right journal. *I recommend the publications of the manuscript after minor revisions.*

More details are given in the attached pdf file.

Please also note the supplement to this comment:
<http://www.geosci-model-dev-discuss.net/5/C320/2012/gmdd-5-C320-2012-supplement.pdf>

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