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Geoscientific
Model Development
Discussions

Interactive comment on "The CSIRO Mk3L climate system model version 1.0 – Part 2: Response to external forcings" *by* S. J. Phipps et al.

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Dear Authors,

The three reviewers and myself consider that your manuscript provides a clear and objective documentation of the response of the CSIRO Mk3l climate system model to external forcings. After the submission of your answer to the Referees' comments, I would thus be happy to consider for publication in Geoscientific Model Development a revised version that takes into account the Referees' comments . In addition to the minor points raised by the three Referees, the discussion of 6K and last millennium simulations should be expanded in this revised version as suggested to Referee 2. Referee 1 asks for a longer discussion of the model ECS and TCR compared to the

ones of other models. Referee three insists mainly of the role of the flux corrections and a longer discussion of this point would be useful too.

Thanks again for submitting your work to GMDD.

Hugues Goosse

We thank you for your comments, and for considering a revised version of the manuscript for publication in Geoscientific Model Development

We have revised the manuscript in response to the comments of each of the referees. In particular, we have made the following significant changes:

- Expanded the discussions of the mid-Holocene and late Holocene experiments to include additional references.
- Expanded the analyses of the late Holocene and last millennium experiments to include changes in oceanic variables.
- Expanded the analysis of the transient and equilibrium climate sensitivities of Mk3L, to explore why the TCR and ECS differ from those of other models.
- Incorporated an analysis of the roles of atmospheric and oceanic processes in driving the changes in the thermohaline circulation in response to increased atmospheric CO_2.
- Incorporated discussion of the potential influence of flux adjustments on the response of the model to external forcings.
- Revised the analysis throughout to include quantification of uncertainties.

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Interactive comment on Geosci. Model Dev. Discuss., 4, 3363, 2011.

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Interactive Comment