

Interactive comment on “A model-data comparison for a multi-model ensemble of early Eocene atmosphere-ocean simulations: EoMIP” by D. J. Lunt et al.

Anonymous Referee #2

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The authors review paleoclimate evidence for sea surface and terrestrial temperatures during the Eocene and survey a wide range of couple climate model studies to discern overall levels of agreement between the models and the reconstructed Eocene climate.

This is a really fine example of a model intercomparison study. Figure 10, in particular, which presents the energy budget changes for a range of models when CO₂ concentration is increased, demonstrating that the model differences derive from locally acting feedbacks, rather than from changes in dynamics, is a particularly nice example.

The papers is clearly written and well illustrated. I agree with Hollis’s comment that the authors are a little generous to the models in their framing of the results of the compari-

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son as showing "very good" agreement: from their figures 4 and 6, there appears to be a substantial possibility that the actual Eocene temperature distribution was substantially warmer at the poles and cooler at the equator than any actual model realization, and even coming close to agreement requires very high levels of carbon dioxide and high climate sensitivity. On the other hand, it's also fair to remind reviewers that this would appear to be the main lesson of the Eocene for us: even if carbon dioxide levels were quite high, climate sensitivity must also have been quite high to account for the reconstructed climate.

Interactive comment on Clim. Past Discuss., 8, 1229, 2012.

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