

Interactive comment on “Influence of LGM boundary conditions on the global water isotope distribution in an atmospheric general circulation model” by T. Tharammal et al.

Anonymous Referee #1

Received and published: 30 May 2012

The manuscript “Influence of LGM boundary conditions on the global water isotope distribution in an atmospheric general circulation model” by Tharammal et al. analyze temporal and spatial variations of the isotopic composition in precipitation in response to individual climate factors. This is an important work and will interest researchers who are thinking about the response of stable isotopes to climate. However, there are several areas that their claim can mislead readers. I recognize that the fourth author is a climate scientist who should be able to correct some of misconceptions that the first author might have. I encourage the first author to communicate more with the fourth author for this and future works. Without correcting several major misleading points, this paper shouldn't be published. If they stick to the isotope response over

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polar regions, this paper will a good contribution to the community.

From the title and abstract, one expects that this is a sensitivity test that will show how isotopes over polar region will be affected by various boundary conditions. However, the results are more focused on climatic responses that are not analyzed properly. I encourage the authors to stick with isotopic sensitivity and drop most climatic response if they are not planning to perform whole different simulations.

Page 1325, line 22-page1326, line 14, sections 4.1, 4.2, and all climate related discussion in section 5 and 6: These are wrong experiments to claim what the authors are saying. They fixed sea surface temperatures and trying to argue that topography, albedo, CO₂, and orbital forcing are affecting global temperatures in relatively magnitude. Two thirds of earth's surface is covered by ocean, and if they keep their sea surface temperature fixed, the other factors of course won't affect temperatures much. To be able to answer how these factors influence climate, they have to at least run the slab ocean model and let the ocean find its equilibrium temperatures.

Section 5.7: tropical response - tropical response is unreasonable because they fixed their SST.

Interactive comment on Clim. Past Discuss., 8, 1319, 2012.