

Interactive comment on “Two drastically different climate states on an Earth-like terra-planet” by Sirisha Kalidindi et al.

Anonymous Referee #2

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General comments

In this paper, the authors modelled the climate of a terra planet (or land planet), a planet with a global land surface, without ocean. The particularity of the present study is the presence of an unlimited underground water layer providing water at all latitude but behaving differently as an ocean. The authors perform various simulations, changing obliquity, snow albedo and a test with a different convection scheme.

Depending on the value of the surface albedo, two different stable climate states appear. A hot and dry state and a cold and wet state. This latter is a novelty, due to the addition of the underground water reservoir and is an interesting result.

However, as the main novelty is the presence of an underground reservoir, more dis-

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cussion would be useful. For instance the authors tested only a fixed depth of 1.2m to mimic a “recycling” of water from higher to lower latitudes. This setup is somewhat artificial and a justification of the current assumptions as well as the potential effect of varying them would be welcomed.

Specific comments

lines 29-30 of page 4. The authors describe the Hadley cells in Figure 4 “narrower” and “wider”. Is it in the vertical direction ? Because they look in both cases 30 degrees wide ...

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