

Interactive comment on “Masked millennial-scale climate variations in South West Africa during the last glaciation” by I. Hessler et al.

Anonymous Referee #1

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The manuscript presents a new high resolution record off Angola covering the period 50–10 ka BP and an attempt to explain a lack of clear vegetation response to the Heinrich Events. It is true that abrupt climate events are seen in many locations around the globe but not in any location. The simplest possible explanations for the lack of clear signal are that the climate response to HEs is just too weak in the region under consideration, or that vegetation in this region is not sensitive enough to subtle climate variations, or both. As far as the interplay between precipitation and evaporation is concerned, it almost always takes place – more precipitation means more evaporation. It does not imply that precipitation changes do not affect vegetation cover.

Secondly, I am concerned about the choice of modeling tool. The UVic model is widely used but it is based on an energy and moisture balance atmosphere model with a

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crude parametrization of moisture transport. It has no explicit atmospheric dynamics and, therefore, it does not simulate change in the ITCZ position, the issue which the authors discussed extensively. The advantage of using an EMIC in the context of this study is more than questionable. Water hosing experiments have been performed with a number of coupled GCMs (also for the LGM conditions) and, since the vegetation feedback is unlikely to be important for this study, the response of the vegetation cover to the shutdown of the AMOC can be easily computed off-line using the output of GCMs. I made a look on published results and it seems that most of models suggest a rather weak response for both temperature and precipitation in this region. Moreover, the results are strongly model-dependent. Therefore, I do not believe that one can learn something new from a simple model.

Specific comments

Page 3512, line 13. Why "subcontinent"?

Page 3513, line 8. "thermal bipolar seesaw" is not the Broecker's idea. The concept of "seesaw" was first proposed by Crowley (1992). Broecker did add the word "bipolar" but his seesaw is fundamentally different from the "thermal seesaw". The term (and concept) of "thermal bipolar seesaw" was proposed by Stocker and Johnsen (2003).

Page 3523, line 14. I do not understand why south African temperature should follow Northern Hemisphere insolation. This is not straightforward.

Page 3527, line 1. What "reduced solar insolation" means? And skip "solar" because insolation means "incoming solar radiation"

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