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Climate of the Past Discussions

Interactive comment on "Glacial fluctuations of the Indian monsoon and their relationship with North Atlantic abrupt climate change: new data and climate experiments" *by* C. Marzin et al.

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I have reviewed the above manuscript. I have to add that I am not an expert of Paleo reconstructions, so I can only comment regarding the numerical modelling experiments performed. Overall I found the paper well written and the results convincing and relevant. In particular the teleconnection from the tropical Atlantic is an interesting new result. I recommend publication after a minor clarification as outlined below.

My comment is regarding the tropical Atlantic teleconnection to the Indian Monsoon that was highlighted in this paper. Kucharski et al. 2008, 2009 and Losada et al. 2010 suggest that the equatorial and south equatorial Atlantic warming influences the

Indian monsoon through equatorial Kelvins wave propagation and modification of the Walker circulation. In particular the Gill-type response to the east of the heating induces an upper- level cyclonic flow and low-level anticyclonic flow that induces low level divergence and reduced rainfall in the Indian region via Ekman pumping. Indeed the upper-level height and wind responses to the tropical Atlantic part of the Atlantic forcing resemble that shown in the Kucharski et al. 2009 paper, and in this paper it is also shown that the (south) equatorial warming alone is able to force a dynamically induced atmospheric cooling in the South Asian region. I think this mechanism should be briefly discussed in this paper.

I also wonder if the role of the north tropical and south tropical parts could be further separated? This could be important as this could be really a completely new mechanism for the paleo teleconnection. However, it may be not necessary for the current paper and analyzed in a future work.

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