

***Interactive comment on “Modeling sensitivity study of the possible impact of snow and glaciers developing over Tibetan Plateau on Holocene African-Asian summer monsoon climate” by L. Jin et al.***

**Anonymous Referee #2**

Received and published: 2 February 2009

The paper deals with the modeled sensitivity of temperature and monsoonal precipitation of north Africa, southern Asia and southeast Asia to various scenarios of snow and glacier fractions over the Tibetan Plateau during the Holocene. It is a well written and interesting paper. However, to make the paper more convincing, three things should be added: 1. A survey of the precipitation and temperature over the Afro-Asian region (i.e., how does the present-day climate of the model looks like?) 2. A more thoroughly comparison of the model results to proxies and, most important, 3. A more thoroughly analysis of the result. I recommend acceptance with major revisions.

Major comments: 1. For the reader's convenience, I would like to see maps showing the precipitation, near-surface temperature and vegetation of the control-run of CLIMBER-2. It is not sufficient to refer to some articles (p. 1270, line 26) 2. In the introduction the authors give a good survey of proxy-results for the Holocene for the Afro-Asian region. However, It would be good to make a comparison of their model-results to proxy-data in the last section. Now they only make some remarks about proxy-data in section 3, but I think there should be added a more thoroughly comparison in the last section. There are a lot of proxy-data available for the Holocene for the African-Asian monsoon, so this should not be very difficult. In this way, it is also possible to 'validate' the ice-scenarios, i.e., which ice-scenario gives the best results compared to proxy-data? Is that ICE4, ICE0 or ICE1/ICE2/ICE3? 3. In the last lines of section 3 and in section 4 the authors speculate that the albedo, absorption of solar radiation, release of latent heat and transport of latent heat might be important. I don't understand why they only speculate. To my knowledge, CLIMBER-2 does compute most, if not all, of these climate parameters (i.e., latent heat, albedo and solar absorption). I suggest that the authors should show these parameters as computed by CLIMBER-2 to validate their mechanisms and to give a more thorough analysis.

Minor comments: 1. The authors do mention the vertical resolution of the atmosphere and ocean in section 2.1, but not the horizontal resolution of the atmosphere, ocean and vegetation model.

Technical comments 1. Line 24, p. 1267: Megathemal -> Megathermal?? 2. p. 1269 line 1: I don't understand the phrase: "and for the past simulations". 3. Line 14, p. 1270: vertical -> vertical 4. p. 1271, lines 19-21. I don't understand this sentence (All....day). 5. p. 1273, line 2: Remove ICEO

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Interactive comment on Clim. Past Discuss., 4, 1265, 2008.

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