

## ***Interactive comment on “Relative impact of insolation and Warm Pool surface temperature on the East Asia Summer Monsoon during the MIS-13 interglacial” by Q. Z. Yin et al.***

**Anonymous Referee #1**

Received and published: 21 April 2014

How non-orbital controls have been responsible for anomalous MIS 13 climate is an outstanding question in late Pleistocene paleoclimatology. Numerous pale-data evidence indicated a prolonged warm and humid climate in Euro-Asia monsoonal region and relatively warm and fresh hydrographic conditions in the western Pacific warm pool (WPWP). Yin et al. presented in this manuscript by using HadAM3 modeling approach and attempted to separate impacts on monsoon climate in Asia from MIS 13 insolation and from increased warming in the WPWP. The modeling approach is successful in producing several features that consistent with some pale-data evidence such as increased humidity in southern Asia but fails to produce warm/humid in northern Asia. The authors finally attributed to this modeling results to the lack of detailed consideration

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of Northern Hemisphere ice sheet extent, which is important in determining the winter conditions in northern Asia. I think that this manuscript presents a beginning step to systematically solve the mystery of MIS 3 climate problem and therefore recommends publishing this paper after the authors take the following comments into consideration in preparing a revised version: 1. Most of Asia summer monsoon in modern climate are driven by southern Indian ocean latent heat transport and the moisture source of Asian monsoon precipitation is from the Indian Ocean. While this study attempted to prescribe more warming in WPWP surface and try to find a linkage between stronger monsoon and WPWP warming, the lack of modified Indian surface ocean needs more explanation. It's worthy to mention that if any modified Indian ocean SST may change significantly the results of modeling output; 2. Evidence exists to suggest El Niño-like condition in the equatorial Pacific coincident with MIS 13 warm and humid in the Euro-Asia (Mohtadi et al., 2006), which implies a more extensive warming extending eastward to the central Pacific during MIS 13. More discussion is needed on what impacts may be generated if the models incorporate more widespread warming in the equatorial Pacific; 3. The proposed change of Northern Hemisphere ice sheet extent during MIS 13 is intriguing and maybe one of the reasons in interpreting relatively warm winter climate in northern Asia. I suggest that the authors present existing evidence (for example, Chinese loess) that clearly indicated relatively weak winter monsoon in northern China to increase the readability of this paper.

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Interactive comment on Clim. Past Discuss., 10, 1025, 2014.

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