Clim. Past Discuss., 4, S505–S509, 2008
www.clim-past-discuss.net/4/S505/2008/

Climate of the Past Discussions

Interactive comment on "Influence of orbital forcing on the seasonality and regionality of the Asian Summer monsoon precipitation" *by* M. E. Hori et al.

Anonymous Referee #2

Received and published: 3 October 2008

General comments

This modelling study nicely illustrates the importance of considering seasonality in paleoclimatology. Seasonality is becoming a *hot topic* and I am sure that the readers of CP will recognize the relevance of the results presented in this paper. In my view, particularly the differences in regional expression of the monsoonal response to contrasting orbital configurations are of interest. However, in my opinion, a major revision is required before this manuscript can be accepted for publication in Climate of the Past. Please find the details of my concerns below.

Major comments.

A. I am not a native speaker, but I have the impression that the English grammar requires considerable improvement, so I strongly suggest asking a native speaker to check the manuscript.

B. Section 1, Introduction. Please discuss in the introduction the relevance of these sensitivity experiments for paleoclimatologists. This relevance is briefly mentioned in Section 4, but since CP has a readership that consists of proxy data experts and modellers, and I would encourage discussing it also in the introduction.

C. Section 2.1 Experimental setup. Please discuss also the setup of your *present-day* control experiment, used for instance in Figures 3 and 9. The captions of these figures suggest that the control simulation is forced with present-day forcings. In my view, you should have used a control simulation with preindustrial forcings for consistency, since these forcings have also been used in the sensitivity experiments. If you have used present-day forcings, please re-plot Figures 3 and 9 using a control experiment with preindustrial forcings.

D. Section 3. In this section, an analysis of the statistical significance of the simulated anomalies is missing. Without such an analysis, it is hard to get an idea of the relevance of the results. So please perform an appropriate test to see if the anomalies are statistically significant.

E. Section 4. This section should be extended and include a more in-depth discussion of the presented results compared to previous relevant studies that are mentioned in the introduction.

F. Figures. The figures should be revised, please find details below. The scaling and calculated anomalies should in any case be consistent.

Detailed comments.

1. Abstract: please make clear what the actual contrast in orbital parameters is that you have used for 125 and 115 ky.

CPD

4, S505–S509, 2008

Interactive Comment

2. For me, kya is a strange notation for age. I would use either ka or ky

3. Introduction. I propose to discuss the study of Tuenter et al (2003, Glob Planetary Change 36, 219-225) here, as they have also performed sensitivity experiments to analyse the monsoonal response to contrasting orbital parameters.

4. Page 720, line 22. *in this highly populated region.* What region? Please explain.

5. Page 720, line 25: *these studies* What studies do you actually mean. Please explain.

6. Page 721, line 4. *Through a simple sensitivity experiment* Please make clear what forcings were prescribed for this experiment.

7. Page 721, line 8: *the Asian monsoon has various sub regions* Do you mean to refer to the Asian monsoon system or to the region affected by the Asian monsoon system? Please clarify.

8. Page 721, line 10: *May, which is followed by the onset of* When does this onset take place? In June? Please explain.

9. Page 721, line 26: *the late Eemian, the 115 kya BP and 125 BP for our experiments*. Please rephrase this sentence. 115 ky BP is the glacial inception. Moreover, 125 ky BP is in the middle of the interglacial, so not *late Eemian*.

10. Page 722, Section 2.1/2.2. Please explain how vegetation is treated in the model. Presumably it is fixed at preindustrial conditions?

11. Page 722, line 4-5. I suggest mentioning that MRI is in Japan.

12. Page 722. Please briefly discuss the model s performance for the modern climate. Does it capture the modern monsoon characteristics reasonably well?

13. Page 722, line 11. *In the tropics, the meridional resolution of the grid is higher* Please clarify how high the resolution actually is.

14. Page 722, line 21. Berger (1991) is not in reference list.

CPD

4, S505–S509, 2008

15. Page 722, Table 1. Please also include the orbital parameters for your control simulation, as you also use results from this experiment in this paper (Figures 3 and 9).

16. Figure 1. I propose including a fourth figure showing the anomaly in insolation between 125 and 115 ky BP. This would make the interpretation of your anomaly result plots much easier.

17. Page 723, line 11. Is the spin-up run forced with preindustrial forcings? Please also give an indication of the trend in some key model parameters, since the model is obviously not equilibrated after 50 years.

18. Page 724, line 3-4. *Eemian glacial minimum*. I would stick to *Eemian interglacial* to avoid confusion.

19. Page 724, line 5. *simulated zonal averaged short-wave radiation*. I presume that the incoming solar radiation is not actually simulated but rather prescribed. Am I right?

20. Page 724, line 19: *an early anomalous heating in excess of 30 W/m2.* Anomalous compared to what? I find this sentence confusing. Are you referring to incoming shortwave radiation or to heating (due to ?).

21. Page 724, line 20. *towards summer and autumn.* Please always clarify if you are referring to the boreal or austral seasons.

22. Pages 724-725, discussion of Figure 2. I find this section rather confusing, as 10-30°N is used for the *Northern Hemisphere mid-latitudes* and 10°S-10°N is used for the *tropics*. In my view, the tropics include all latitudes shown in Figure 2. For instance, 15°N is certainly not in the mid latitudes.

23. Page 726, line 2. *-20°N* should presumably be *0-20°N*. See also Page 727, line 24.

24. Figure 3a-b. Please use the same scaling for Figures 3a and 3b to allow for a

CPD

4, S505–S509, 2008

meaningful comparison. I would also suggest to plot the 125 ky BP result first (as Fig. 3a), and 115 ky BP as Fig. 3b. So the oldest period as the (a) figure. This also applies to Figures 5 and 8.

25. Figure 3: Please also include the anomaly plot between 125 and 115ky and include the boundaries (in light grey for instance) of the areas shown in Figure 4.

26. Figure 4. I suggest using the same scaling for Figures 4a and 4b to allow for a meaningful comparison. Also to show the interannual range to get an idea of the significance of the results.

27. Figure 6. What is the unit of the results shown in this figure?

28. Page 727, line 8. Figures 6, 7, 8. To avoid confusion, please present consistent anomalies: either 125 minus 115 ky BP, or 115 minus 125 ky BP.

29. Figure 9, title. *kha* instead of *kya*. In the caption, $20^{\circ}C$ should presumably be $20^{\circ}N$.

30. Page 727, line 28. *maturing of SST* Please explain what this means.

31. Page 729, line 4. *there is a strong possibility that the monsoon seasonality will be shifted* It is not clear from this sentence when this shift is to take place. Please elaborate on this point.

Interactive comment on Clim. Past Discuss., 4, 719, 2008.