Climate
of the Past
Open Access
Discussions

Interactive comment on "Global sensitivity analysis of Indian Monsoon during the Pleistocene" *by* P. A. Araya-Melo et al.

Y. Yu

yyq@lasg.iap.ac.cn

This manuscript quantified the sensitivity of Indian monsoon to external forcing using a new advanced methodology, which is better than previous commonly used methods in many ways. This new methodology can help us fully understand physical mechanism for Indian monsoon changes. However, most reader must be not familiar with this methodology, so the authors should describe it with emphasis on its physical meaning rather than mathematical equations only. Additionally, four variables selected in this manuscript describing Indian monsoon may be enough to fully understand its changes.

Major comments

1. Please describe the physical meaning of the emulator method.

2. Four variables are selected in the manuscript in order to describe Indian monsoon, authors had better explain why these four variables are chosen. In fact, the Indian monsoon is mainly determined by heat contrast between the continent and ocean, thus it may be necessary to add 1-2 variables such as Webster-Yang monsoon index etc. to help understand physical mechanism for the sensitivity.

3. P1610, L13-14, the authors mentioned "detect potential non-linear" in the abstract, but it seems to the non-linear process is hardly touched in the text.

4. .P1628, L5-10, Figure 5 of Williams et al. (2001) is related to global mean temperature response to CO2 doubling, but this manuscript just discussed local temperature response in Indian Ocean or continent. So these are different issues, and it is not necessary to combine them in this manuscript.

Minor comments:

1. P1611, L4, the first word "paleoclimate" is misspelled.

2. P1611, L19, the word " contast" is misspelled.

3. L1613,L11, "ice boundary" is not accurate, "glacier boundary" may be better.

4. L1622, L24, does the latter mean "logarithms" or something else? There is a bit confusing

5. Fig.13, The caption is not consistent with the plot. For instance, the precipitation is not plotted as indicated in the caption.

6. Figure 7 reveals that all four selected variables are very sensitive to precession, but only SST and continental temperature are sensitive to CO2. It is very interesting, and it will be very nice if the authors can provide some explanation.

7. Fig. 11, the difference between Experiments 11 and 15 is not very persuadable, and I suggest that the difference between Experiment 11 and ensemble mean (excluding experiments 11 and 40) should be presented in this figure.

C1104