

Review “Sensitivity of the Eocene Climate to CO₂ and orbital variability”, by John S. Keery et al. (2017, *Climate of the Past*, cp-2017-60). Second Round.

The authors satisfactorily answered my major concerns, raised in my review of the first version of this manuscript. I particularly appreciate the way the authors tackled the disparity in time-scales between CO₂ and orbital variability, for example by adding the color scale to Figs. 5 and 6, and by integrating new Figures 12, 13 and 14 into the revised version of the manuscript.

However, I have two small questions regarding the latter three Figures.

1. In the text, the authors write “*In each of the monsoon areas, the increase in precipitation ... is more pronounced at high atmospheric concentration of CO₂*”. But, according to Figure 14, the American monsoon is “*wettest*” under low CO₂ forcing. Is this a mistake in color-coding, or does the American monsoon system really respond differently to CO₂ forcing? If the latter is true, this should be discussed in much more detail.
2. Figures 12, 13, 14 all show some degree of non-stationarity: the monsoonal index seems to depend not only on the precession index, but also on whether the precession index is increasing or decreasing. In other words, the emulated values of the monsoon index do not represent a line, but an ellipse. This is a very interesting result, but I do not fully understand how the authors came to this result, and I would like to read more about these values were obtained. Please discuss which limb of the ellipse represents increasing precession index (and vice versa), and please discuss why the American monsoon system seems to be more “non-stationary”, compared to the African monsoon system.

Once the authors will have addressed these points of discussion regarding Figs. 12 – 14, I consider this manuscript suitable for publication in *Climate of the Past*.

Technical corrections

- ❑ **Page 3, line 18:** ¹⁸O instead of ¹³O
- ❑ **Page 5 and throughout the paper:** There are a lot of different opinions on how to write 1000 years in a geologic scientific context. However, the “k” shown in upper case is an incorrect usage. I prefer the use of “kyr” for durations and relative time, and “ka” for thousand years ago (i.e. absolute time). See http://www.ldeo.columbia.edu/~ncb/Selected_Articles_all_files/25_Stratigraphy.6.100.pdf
- ❑ **Page 4, lines 25 – 30:** I still do not understand why a discussion of cyclostratigraphic tuning techniques is relevant for this work.
- ❑ **Table 6:** Draw horizontal lines under the PC3 rows, so to visually separate the three rows that correspond to a single climatic measure (e.g. DJF_temperature).