Kim et al. present a comprehensive study on the orbital influence on the tropical Pacific during the Cretaceous using the firsthand, high-resolution paleoclimate proxies. Time series analysis and the 405-kyr tuning of the d13C enable a high-resolution astrochronology allowing the evaluation of the dominant cyclicities of the export production at an unprecedented level. The choice of the proxies for the organic carbon export is reasonable. This study provides an excellent example of how to explore the driving force in the tropical biological pump. Therefore, this study is of high quality and publishable after addressing the following issues.

1. Missed information about the tuning in the main paper

Astrochronology is the basis of the whole story. Unfortunately, the cyclostratigraphic results are only presented in the Appendix. One has to go to the supplementary figures to get information such as power spectra, determination of the sedimentation rate, filter, and tuning strategies. Therefore, the structure of this paper needs an improvement to enhance its readability. For example, Figure S2 should appear in the main paper. Also, it would be good to see (at a minimum of one pair of) the power spectrum and wavelet analysis in the main paper but this should be decided by the authors.

Moreover, the astronomical tuning strategy is generally straightforward in this case study. Assuming that the 5 m wavelengths represent long eccentricity cycles, a mean sedimentation rate of about 1.25 cm/kyr is supported by other geologic evidence. However, the power ratio method can be subjective and it is unclear whether all assigned 405 kyr cycles are fine or not. One solution is to add results using more objective statistical tuning approaches, such as ASM, TimeOpt, and COCO. As you can see below, quick COCO/eCOCO analyses of your data strongly support the robustness of results presented in this manuscript, although the choice of 405 kyr cycles (for example, at ~285 m) needs more discussion.

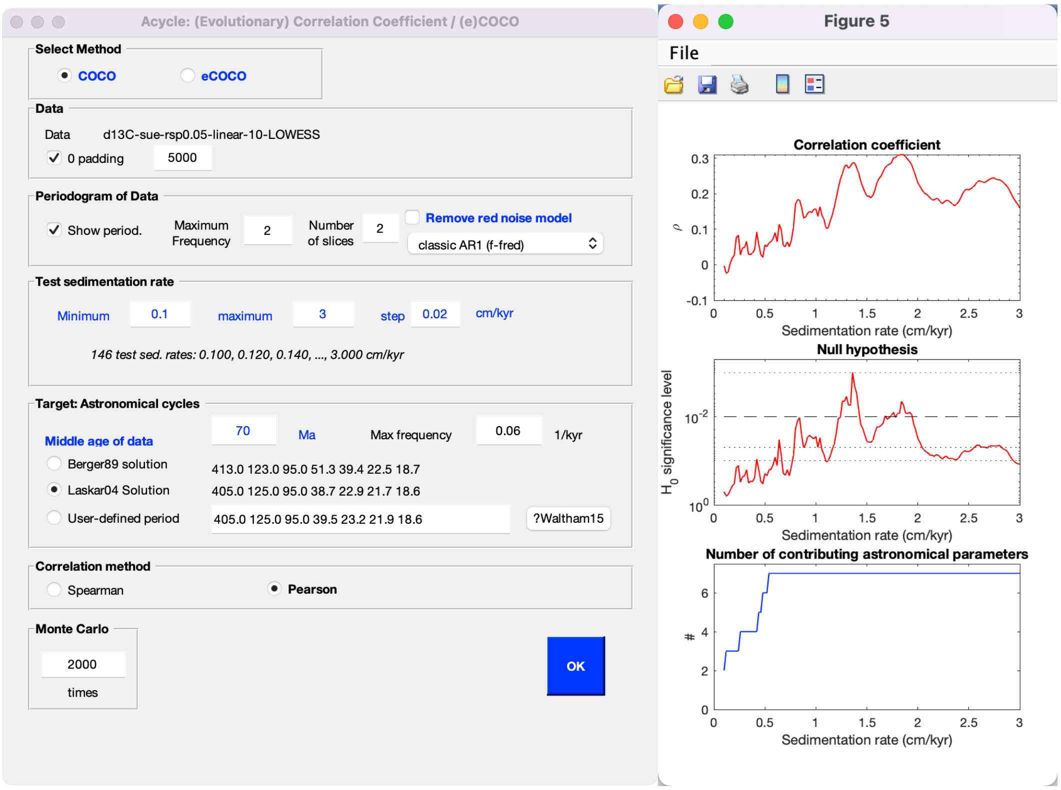
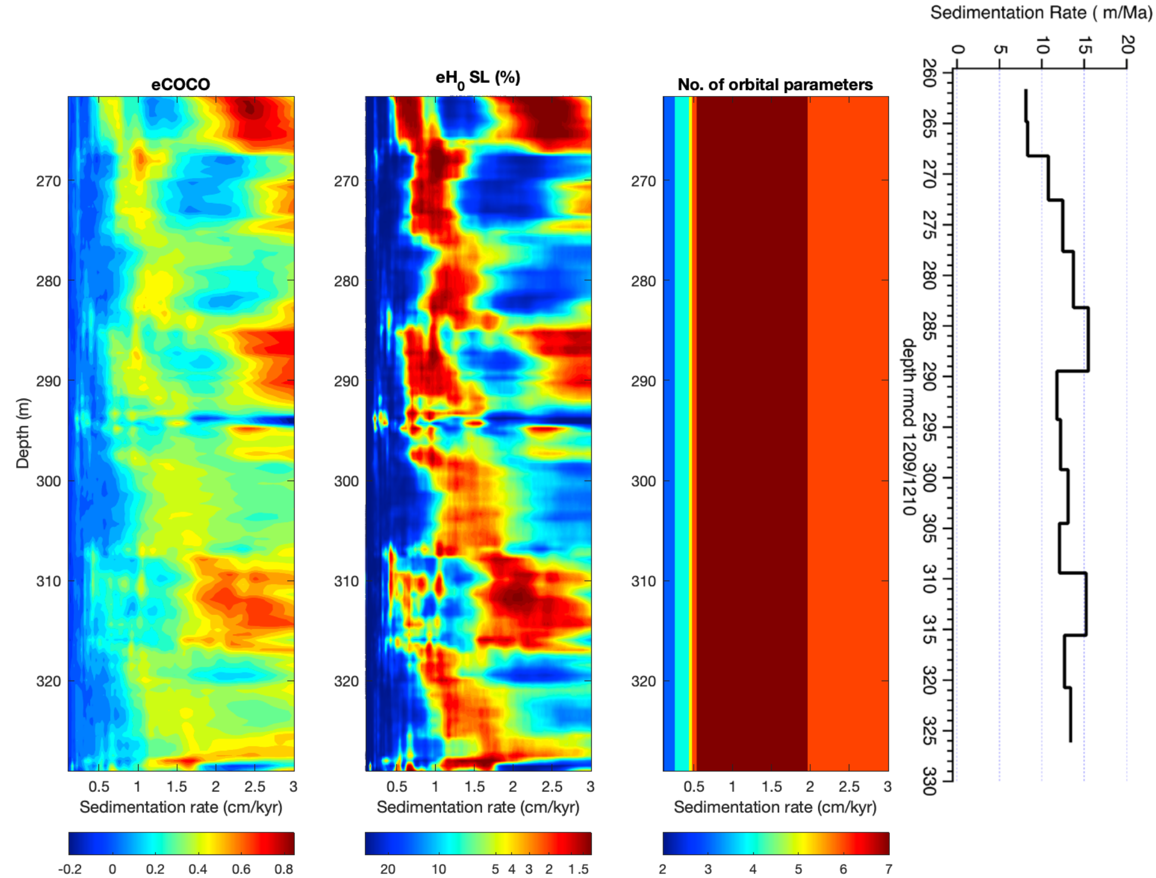


Figure 1. The composite d13C data series has been interpolated using a median sampling rate of 0.05 m. A 10 m lowess trend was removed. The COCO method suggests the most likely sedimentation rate is at ~1.3 cm/kyr. Multiple peaks suggest the sedimentation rate is variable as shown in the following eCOCO sedimentation rate map.

eCOCO analysis using an 8 m sliding window demonstrates the evolution of the sedimentation rate, which generally supports your results, but does show a minor discrepancy at ~285 m.



2. Unclear relationship between the thermocline and precession

This paper argues that precession paced ocean export production via influencing the thermocline depth. In the text, shoaling of the thermocline is thought to have occurred in response to changes in precession. This is a critical component of the story; however, the mechanism is not presented. In Figure 5, the authors note that "a shallower thermocline at high precession" represents a huge jump. Please fulfill this gap in the main text.

Moreover, the paper mentioned that "ENSO-like variability" existed in past greenhouse conditions. It would be better if this variability pattern can be introduced so readers don't have to read other papers (e.g., Davies et al., 2012) to understand this term.

Minor issues

1. Line 28: add "405 kyr," before 100 kyr.

2. Line 111： sampling time of 12 s. Do you have evidence that 12 s is sufficient for the data quality? I have tested a range of sampling times ranging from 10 s to 120 s, it looks like XRF can usually produce stable results after ca. 20 s.

3. Figure 1: Please explain the meaning of shade zones in the map (brown, light olive, blue, and purple).

4. Figure 3: obliquity period was not 41 kyr. Alternatively, the La2004 solution predicts a 38 kyr cyclicity for this time interval.

5. Figure 4: the middle rows are too busy. Why there is no BFAR data at the interval of 66.74-68.71 Ma?

6. Line 468: Remove “Strong” in the caption.

Mingsong Li