

Clim. Past Discuss., referee comment RC1
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Comment on cp-2022-40

Anonymous Referee #1

Referee comment on "Response of terrigenous weathering to the African monsoon during the penultimate deglaciation and the last interglacial period" by Christopher John Lepre et al., Clim. Past Discuss., <https://doi.org/10.5194/cp-2022-40-RC1>, 2022

In this manuscript, Lepre and colleagues present a new XRF record from a marine core recovered near Africa in the tropical Atlantic Ocean. I find the data valuable and many points of discussion interesting. However, this manuscript lacks clarity. I think every section could be simplified and reorganised to make the main messages easier to grasp. I would recommend major revisions. However, I believe the manuscript can be eventually published in Climate of the Past because there are many good elements in this manuscript. But the main results must be better highlighted. Otherwise, the reader can lose track of this paper's story.

Was HS11 dry (line 12) or wet (line 26)? The abstract is conflicting on this point.

The last sentence of the abstract is confusing for two reasons: 1) the authors shift from standard dates to 'Middle Stone Age' and 2) nothing in the abstract suggests that some archaeological reconstructions are also performed. These two elements should be better introduced if they contribute to the take-home messages of the manuscript.

--> After carefully reading the manuscript, I came up with a similar conclusion regarding section 4.3. Perhaps the best option here would be to remove this archaeological element from the manuscript? It is not developed enough to make it significant/relevant.

I think the introduction needs some more work. At the moment, it is not clear what the main research question really is. Is it about presenting a new record? Is it about discussing the influence of marine dissolution events? Is it about archaeology? These elements are interesting and may deserve a place in this manuscript, but the paper would benefit from a more precise organisation. The introduction and the title do not focus on the same study elements.

L114: Several potential source areas are announced, but only one is discussed. Is it

because the Bodélé Depression produces so much dust that it overprints the signal from other regions? Please explain. Alternatively, describe one or two more regions of importance.

I do not understand the following sentence (L149-151): "Other intervals of the $\log(\text{Rb}/\text{Sr})$ timeseries were calibrated using the mean sedimentation rate of 1 cm per 340 years (Fig. 2)". There seems to be an age-depth model, so why use the mean accumulation rate as the base for linear interpolation? A similar transformation is mentioned on lines 163-165. "To assess if other components of the terrigenous fraction carry orbital forcing, the $\log(\text{Rb}/\text{Sr})$ depth (cm) series was scaled to time by using the core's overall sedimentation rate of 1 cm = 0.34 kyr and then resampled to every 0.17 kyr, which was the median/mean sample interval (0.5 cm) of XRF measurements". This is very confusing to me.

Fig A1: I would suggest inverting the axes for insolation. It would make more sense to associate insolation minima with diatom peaks.

My apologies if I have missed the explanation, but I do not understand why the authors partially focus on the period MIS5e/HS11. Why is this period more relevant than any other? Looking at Figure 2, it doesn't particularly stand out. Many parts of the manuscript oscillate between considerations of the entire record and considerations of this period of interest. It is not the easiest to follow.

Looking at the values of $\log(\text{Rn}/\text{Sr})$ in fig 6, it is not clear that the 128-124ka period is the wettest. The period 135-136 is arguably wetter based on the interpretation of the record. In addition, I do not find the similarity with insolation striking. Many differences suggest that if insolation is a driver, it is not the only one.

I find the last section (4.3) a bit out of context within this manuscript. I do not think it adds anything to the story, except perhaps more questions. I would recommend the authors significantly expand on it to contextualise the archaeological findings mentioned, why they are important, and why they can be explained by the model discussed here. Alternatively, it might be better to skip this part entirely and focus on the climatic aspects.