

## ***Interactive comment on “Holocene climatic changes in the Westerly-Indian Monsoon realm and its anthropogenic impact” by Nicole Burdanowitz et al.***

### **Anonymous Referee #2**

Received and published: 15 February 2021

The paper submitted to Climate of the past by Burdanowitz et al. (Holocene climatic changes in the Westerly-Indian Monsoon realm and its anthropogenic impact), aims at providing new insights into how the potential interactions between ITCZ dynamics and Indian Monsoon, in the one hand, and Sub-Tropical Westerly Jets, in the other hand, may have driven orbital and millennial climate changes over the NE Indian monsoon area during the Holocene.

Although this issue is clearly an important one, the discussion does not successfully reach its objectives because the manuscript gives a feeling of confusion and ad-hoc argumentation in many places. The discussion is based upon six main sets of data ob-

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tained in core SO90-63KA, among which only three are (apparently) published here for the first time, and are given a thorough description in the method chapter (Lithological Mass Accumulation Rates, Uk37'-SST, and the average chain length of the n-alkanes homologues 27-33). The other data having been published elsewhere, the readers are left with only minimal to no piece of information about how these proxies were obtained and/or are interpreted. The lack of information is detrimental to a clear understanding of the authors' arguments. For instance, Ti/Al is interpreted, here, as being positively associated to higher river contributions (fig. 2), which is opposite to what has been concluded for sediments from the tropical Atlantic (Govin et al., 2012). Why is that so? Clearly elemental ratios should be interpreted in the light of regional/local rock sources, transport mechanisms, etc.. The basis for the interpretation of Ti/Al in the Arabian Sea should be summarized somewhere in the method chapter. I've had the same kind of issues with basically all the proxies used in the manuscript. How EM3 record was obtained? What does it mean? What about the planktic DNA ? Etc. I was also surprised that LIT-MAR is given such an importance, given the fact that the core was retrieved thirty years ago. It is very likely that wet weights obtained for calculating DBD have been largely modified by evaporation since the core retrieval. The authors themselves point out that some part of the core completely dried out. To which extent can this drying impact the DBD and does that have a significant effect on LIT-MAR estimates?

Because the data are not presented in a dedicated “result” chapter prior to the discussion, one has the impression that the authors build their interpretation by jumping from one proxy to another, highlighting the patterns that suit their hypothesis. Every now and then they even appeal to important data, not presented in the article. This is the case for *G. ruber*  $\delta^{18}O$ , which they cite to strengthen their argument on past changes in precipitation and river runoff. If the *G. ruber*  $\delta^{18}O$  record has already been published and can bring interesting pieces of information about salinity (precipitation, runoff) and temperature changes, it should be shown in the present manuscript and thoroughly compared with Uk37' SST and Ti/Al records... Not used to highlight just a specific feature observed in the Ti/Al record. The lack of a thorough discussion

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about the data also results in some key features of the records not given the proper attention. What about, for instance, the long-term change in the Ti/Al record, which amplitude contrasts with the small amplitude of the millennial-scale variations? Why is the LIT-MAR record showing a rather opposite mode of variability (ie. lack of long-term mode of variation, short episodes of higher MAR)? Why are the Ti/Al and LIT-MAR so evidently decoupled from one another?

All the above questions about proxy interpretation and comparison should be addressed in the manuscript. Thus, the manuscript needs a thorough rewriting with (i) added pieces of information about the proxies signification and interpretation; (ii) and a dedicated “results” chapter in which records are presented thoroughly before being referred to in the discussion. This should serve as a basis for a more organized and clearly argued discussion.

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Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-141>, 2020.