Clim. Past Discuss.,
https://doi.org/10.5194/cp-2020-13-AC1, 2020

Climate of the Past
Discussions

Interactive comment on "Late Paleocene – early Eocene Arctic Ocean Sea Surface Temperatures; reassessing biomarker paleothermometry at Lomonosov Ridge" *by* Appy Sluijs et al.

Appy Sluijs et al.

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Dear editor,

We thank the Reviewer #1 for his/her comments. It seems to us that none of them present substantial criticism to any of our interpretations. Therefore, we will be able to swiftly incorporate all of his/her suggestions in our revised version, as we outline in our attached replies to all of his/her individual comments.

Sincerely, on behalf of all authors,

Appy Sluijs

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Sluijs et al. used the previously analyzed samples which were stored for over a decade. As I am interested in GDGTs, I was curious how the old and new GDGT data would differ, although I assume the offset would be small if stored properly and measured in good condition of the HPLC/MS. Figure 3 shows the result and regression analysis between the old and measured GDGTs results. Both TEX86 and BIT look comparable. However, I found that there are few outliers in the TEX86 dataset from the supplementary data. I plotted all their new vs old TEX86, and the R^2 value is lower to 0.66. Still comparable statistically, however, the authors did not mention about the outliers.
REPLY: These outliers represent data points for which the intensity of some isomers was insufficient in our reruns for proper quantification. For these 5 samples, TEX86 values were anomalously low as a consequence. These were the open fields in the spread sheet of the raw data but for clarity we have now marked them 'below detection' for the revised version of the manuscript. This further clarifies based on which data the 0.82 R^2 of Figure 3 is based.

I appreciate the authors for providing their valuable dataset and kindly included the spreadsheet calculation for the readers to follow. For RI (ring index), however, I found that the calculations were all missing while it can be calculated from the dataset. I calculated again from their data but the values were slightly different. The maximum difference between the reported value (column BX) and the calculation I did is up to 0.11 RI unit. Although the difference is small, this would impact on some of the samples that have _RI near 0.3, screening whether the data is reliable or unreliable near its cutoff value.
REPLY: We thank the reviewer very much for noticing this. The discrepancy was caused by an error in our excel calculations so that Cren isomer was not properly included. The numbers will be corrected in the revised supplement. The difference is indeed minor as the reviewer indicates and in fact it results in lower ARI and so we found no extra unreliable data points in our rescreening of the data.

Overall, I suggest a moderate revision of the manuscript, especially in the data analysis first, before it can be accepted by CP. Also, the manuscript contained plagiarism (line 160-163) and many run-on sentences which made it difficult in absorbing the information when reading, therefore, I suggest a more improvement in the scientific writing for the next version.
REPLY: We will make sure to reword this section and shorten sentences where necessary.

Some specific comments are below:
Line 20-21: add "ACEX"
REPLY: this shall be done

Line 20-52: the abstract seems to be too long and includes too much information of the study results in detail. Also, line 46-50 is just copied and pasted here from the main text (line 806-810).
REPLY: we will shorten the abstract significantly and avoid textual overlap with the rest of the text.

Line 37: the background SSTs in early Eocene generally exceed
REPLY: this shall be done

Fig. 1.