



Interactive comment on “Temperate Oligocene surface ocean conditions offshore Cape Adare, Ross Sea, Antarctica” by Frida S. Hoem et al.

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Received and published: 12 April 2021

Dear referee and editorial team,

Here below, you find our response to the comments the reviewer rose on our paper Hoem et al., CP- 2020-139. We thank the reviewer for constructive and positive feedback on our manuscript. We propose the changes indicated in the text below.

Best regards, Frida S. Hoem on behalf of all co-authors

Response to anonymous Referee #2

The manuscript of Hoem et al, fills in an important gap in the understanding of the Oligocene Antarctic ice sheet. The results, interpreted as evidence for relatively warm

C1

SST's offshore Antarctica during the Oligocene, are consistent with the lack of ice-rafted debris from the Wilkes Land core. Overall, I find the manuscript compelling, and my comments are limited to minor revisions, with the exception of a comment about the age model. The manuscript is well structured and organized. My one criticism are some awkward turns of phrase, that could be remedied easily during the pre-publication phase.

Authors response: We thank the reviewer for the positive opinion of the paper, and will respond to the minor revisions accordingly below.

Line 33: awkward wording, “from warm influence from. . .

PROPOSED CHANGES: We will change this to: “the influence of warmer water”

Line 114-115: Sentence is a fragment. Also do not begin a sentence with a numerical symbol (e.g. 200. . .)

RESPONSE: We will change the text accordingly

Line 225: “central part of the site”, change to “upper Oligocene section of the core”

RESPONSE: We will change the text accordingly

Line 324 and elsewhere: latin phrases like a priori should be italicized

RESPONSE: We follow the CP submission guidelines, which states: “Common Latin phrases are not italicized”

Line 358-359: change to “the region could have been under the influence of. . .”

RESPONSE: We will change the text accordingly

Line 428-429: awkward sentence structure, suggest rewording

RESPONSE: We agree and will change the wording

Line 451: mid-Oligocene is not a recognized stratigraphic interval. Maybe say “latest early Oligocene to earliest late Oligocene”.

C2

RESPONSE: We will change the text accordingly

Age model There is considerable uncertainty in the age determinations for the early Oligocene. For example the age model datums indicate ~ 400 m/Myr between the ornata and labradori datums.

RESPONSE: Yes, there is uncertainty in the age model, last occurrence datums (in the case of *S. ornata*) are less robust than first occurrence datums due to the fact that species can get reworked and deposited in sediments younger than when they lived.

Would the authors also please comment and justify the assignment of the normal magnetozone in core 40 to C12n? I also note the tie line between the normal magnetozone in core 40 and C12n is incorrectly placed (discussed below in the figures comments).

RESPONSE: We agree on this. The change of polarity, which we suggest it may correspond to the change between C12r and C12n, needs to be placed above, in the core 39.

PROPOSED CHANGES: Accordingly, we will move this line to core 39 as indicated above. Overall, the discussion of the uncertainty in the age model is honest and realistic.

Figures Fig 2 I suggest plotting the age of the biostrat datums as well as indicating the depth.

RESPONSE: The top panel of the figure indicates the age. We argue that having the age constraints written behind the biostratigraphic markers together with the lines drawn between the paleomagnetic chrons and their respective GTS2012 age is sufficient.

PROPOSED CHANGES: In the age model Figure 2 (see attached figure below) we will incorporate the paleomagnetic data of (Jovane et al., 2020) to come to a state-of-the-art age model reconstruction. The tie line between the reversal boundary at approx. 373 m and the base of C12n has been incorrectly placed. The line tied to the base of

C3

C12n cannot be tied to the top of a normal chron in the magstrat record.

RESPONSE: We thank the reviewer's observation, and we will move the line in Figure 2

References: Jovane, L., Florindo, F., Wilson, G., Leone, S. d. A. P. S., Hassan, M. B., Rodelli, D., and Cortese, G.: Magnetostratigraphic Chronology of a Cenozoic Sequence From DSDP Site 274, Ross Sea, Antarctica, Multi-Disciplinary Applications in Magnetic Chronostratigraphy, 2020. 2020.

Interactive comment on Clim. Past Discuss., <https://doi.org/10.5194/cp-2020-139>, 2020.

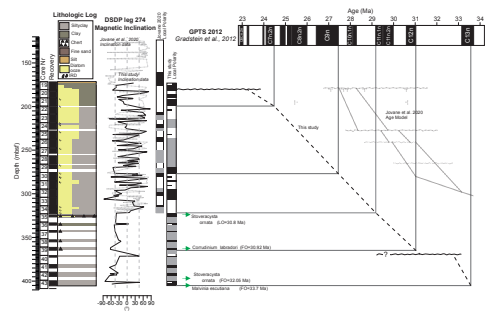


Fig. 1.