Clim. Past Discuss.,
https://doi.org/10.5194/cp-2017-113-AC2, 2017

Climate of the Past Discussions
Open Access
EGU

Interactive comment on "Land–sea coupling of Early Pleistocene glacial cycles in the southern North Sea exhibit dominant Northern Hemisphere forcing" *by* Timme Donders et al.

Timme Donders et al.

t.h.donders@uu.nl

Received and published: 19 December 2017

Donders, T.H. et al.

We thank the reviewers for their constructive and specific comments and will use them to improve the interpretation and data representation. Here we provide a first reply to the comments and indicate where we plan to make adjustments, and provide additional information to support our interpretations. We feel that with extension of the discussion and added detail as indicated below we are able to meet the concerns of all reviewers.

Reviewer David Naafs Comment: Discussion on the phase relationship "the discussion

Printer-friendly version

Discussion paper

on this specific topic in this manuscript is rather limited and is missing a discussion of crucial prior work on this topic" Reply : We originally aimed at providing a compact paper focusing on the evidence on phase relations we can provide from the new data, but we acknowledge that more information is available. We will expand the introduction and discussion on this matter following the suggestions of the reviewer to provide a more balanced assessment of the forcing mechanisms.

Comment: In addition, I wonder whether the age model is robust enough. The low-resolution benthic d18O record of this site does not always look like the LR04 stack. Reply: the validity of the age model is addressed in detail in the replies to Stijn de Schepper, which we will not repeat here, but in short we will focus on more extensive discussion of records in the same basin, in particular the Noordwijk record from Noorbergen et al. (2015) where an independent tuning to LR04 is available. As the reviewer acknowledges, the key results of our paper however, depend on the internal relations between the proxies from the same record and do not rely on an exact match with the LR04 stack.

Minor comments:

Comment Line 51-55: this is a bit of a weird ending of the abstract, especially in the context of the main focus of the paper that is stated at the beginning of the abstract. The authors should end the abstract with a clear conclusion of what, according to their work, the phase relation is between forcing and climatic response. Reply: the abstract will be adapted to better reflect the conclusion

Comment Line 66: a full review paper on IRD in the North Atlantic during the Plio/Pleistocene is given in (Naafs et al., 2013). Reply: add IRD references is a good suggestion

Comment Line 73-78: somewhere make reference to mechanism proposed. Reply: will add reference to proposed forcing mechanism (Haug et al., 2005)

Printer-friendly version

Discussion paper

Comment Line 82-88: here other recent publications that refute or support Raymo's hypothesis. Reply: we will add more extensive discussion on the phase relationship between forcing and climatic response in the early Pleistocene

Comment Line 202: what statistical basis was used to reject samples? What is the distinction between poor and not poorly preserved? Reply: Preservation was based on a visual inspection and assignment of a relative scale of 1-5 of preservation, after which the poorest 2 classes were discarded. The best preserved specimens (cat. 1) had shiny tests (original wall calcite) and showed no signs of overgrowth. Category 2 specimens showed signs of overgrowth but were not recrystallized and cat. 3 specimens were dull and overgrown by a thin layer of secondary calcite. Cat 4-5 specimens were discarded because primary calcite was (nearly) absent.

Comment Line 280: cite (Eglinton and Hamilton, 1967) for odd over even predominance of nalkanes. Reply: we will cite Eglinton and Hamilton, 1967 on n-alkanes

Comment Line 289 change sentence to "brGDGTs), produced by bacteria and that are abundant in soils, versus that:.." Reply: textual comments will adopted

Comment Line 290: add reference Reply: we will cite Sinninghe Damsté et al., 2002 for crenarchaeol

Comment Line 467: is there any other supporting information for the input of acidic peat input? For example, modern-day acidic peats are characterized by the dominance of the C31ab-hopane (Dehmer, 1995; Pancost et al., 2002), which is normally only present inmature sediments. Reply: as seen in the expanded pollen diagram (Fig. S2), Sphagnum spores are also mostly enhanced in the glacial MIS intervals in support of the C23 biomarker. In the revision we plan to also include the isomers index of the de C31 hopanes that when immature, provide an indication for acidic peat

Comment Line 473-477 The authors should provide a ternary plot of the brGDGT distribution to rule out a significant non-terrestrial contribution; Reply: construction of a

ternary diagram is in progress and will be added in the revision. Comment Fig 3 readability

Reply: the aim of the figure is to compare various proxies and they therefore need to be together. The figure is now rotated but will be horizontal in final version, improving visibility

Comment Suppl data Reply: We will add the absolute abundances of the individual brGDGTs (and crenarchaeol) to enable recalculations

---

Interactive comment on Clim. Past Discuss., https://doi.org/10.5194/cp-2017-113, 2017.