

Interactive comment on “Role of the North Atlantic circulation in the mid-Pleistocene transition” by Gloria M. Martin-Garcia et al.

Anonymous Referee #2

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Dear Natascha Töpfer Copernicus Publications Editorial Support

I hereby you receive my report on the MS "Role of the North Atlantic circulation in the mid-Pleistocene transition" by Martin-Garcia et al. The authors analysed the planktonic foraminiferal patterns of southwestern Iberian margin site IODP-U1385 comparing these data with two key sites of Atlantic ocean as ODP Sites 607 and 980. This study documented important changes in planktonic foraminiferal assemblage during glacial/interglacial oscillation between 812 to 530 ka (MIS20-MIS14). This reconstruction suggests a major change in general North Atlantic circulation during MIS16. In surface, this change consisted in the re-distribution of water masses, with the subsequent thermal variation, and occurred linked to the northwestward migration of the Arctic Front (AF) and the increase in the North Atlantic Deep Water (NADW) formation.

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The present version of the manuscript is confused and it is very hard to follow the text with these figures. Systematically, the reader has to jump from one figure to another, when it could be possible to plot the data in one single figure. The authors suggest a possible link of the observed changes with change in ciclicity over the Mid-Pleistocene Transition, but a detail discuss on time-series is missing. Moreover, the study interval corresponds to the end of the Mid-Pleistocene Transition and without a detailed spectral and wevelt analysis on proxy records is very hard to propose in the manuscript a connection with this important, but not well understood, climate transition. In my opinion, the authors have to describe, using a statistical approach on proxy data, difference, similitude and trend between the three sites. This statistical approach could be used also to evaluate possible thermal gradients. The authors plotted as proxies the NAC and WARM SURFACE groups, but the connection with glacial/interglacial cycles is not clear. This is mainly evident for the NAC signal. This signal is characterised by noise and if we exclude, the increase in abundance at ca. 655ka upwards, the signal does not show a particular pattern. The pattern of WARM SURFACE shows a clear strong increase in abundance in correspondence to the onset of interglacial interval. This pattern is not strongly described in the manuscript. There is an explanation for the strong peaks in abundance of *N. pachyderma* in coincidence of Termination VIII? This peak is in full deglaciation phase. I would like to suggest to add in the methods a description concerning the construction of the planktonic foraminiferal groups used in the manuscript. I am very surprise to see that *Globigerina falconensis* is considered as part of warm surface assemblage. This species is generally considered as cool water taxon.

In my opinion the strong difference in time resolution of the sites render very difficult the comparison between the *T. quinqueloba* and *N. pachyderma*. In addition, where is the distribution of these taxa for site 607? In addition, the strong difference in NAC patterns from site U1385 and site 980 is not well described and in my opinion not discussed in detail. Why Nps is abbreviate? Please write *N. pachyderms* left coiled – See line 192 Line 168 – the authors reported Fig.4c-e, But where is Figure 3? Line 213 – Are you

sure that the correct figure is 2? I think that the figure to call up is the Fig. 3

My overall conclusion is that the manuscript is suitable for the journal but unfortunately, it needs moderate to major revision.

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