

Interactive comment on “Reinforcing the North Atlantic backbone: revision and extension of the composite splice at ODP Site 982” by Anna Joy Drury et al.

Anonymous Referee #1

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A very well written and easy to follow Ms. I have no issues with your conclusions, which seem robust and exciting to me. In addition to the minor issues I raise below, I think the impact of your Ms would be greater if you were to incorporate into your figures the original GRAPE and spectral reflectance data used to define the shipboard splice. This way you could illustrate more clearly how what seemed like decent splicing at the time has been shown to require revision with XRF-core scanning. I don't think this finding is surprising to a stratigrapher (it's just part of how we can build on and improve high-quality shipboard work, post-cruise), but it would represent a more impactful lesson for. e.g., proxy users that do not necessarily consider splice/age-model robustness when interpreting their data.

Minor comments: Page 3, line 10: its not the site's proximity to the Med Sea that makes it important for correlation to the Med, it's the site's location in the North Atlantic that makes it important for correlation to Med records.

Page 4, lines 4-14: presumably you generated benthic d18O data from Holes A, B and C from stratigraphic gaps identified in your new splice and from portions in the existing shipboard splice (to verify no offsets in values). I think it is necessary to make that clearer in your methods text here. I know I can look at Table 3, but make it easier for the reader to understand. Saying generically that you measured 263 new data between 200 and 280 mcd is not informative enough. Having now read on I can see that the statement starting on page 5, line 4 needs folding into your methods here.

Page 4, line 28: I would like to see the rmcd splice Tables 4 and 5 in the main text. It's a hard enough job convincing people that stratigraphy is vitally important and that all subsequent results are potentially erroneous if your splice and age model is wrong. This sort of study underlies why proxy users should not blindly use published stratigraphies and having the new splice tables as supplementary tables makes stratigraphy feel like just that, supplementary.

Page 5, line 9: it would be useful for you to show evidence for the existence of these strong cycles in benthic d18O and d13C and their anti-phase relationship, beyond visual inspection (show results of TSA in the depth-domain for starters?).

Page 5, line 31: replace 'as' with 'since'.

Page 6, line 18: please include the Drury et al. Site U1337 record in Figure 6. I'm pleased that you comment on the timing of your obliquity-dominated intervals and amplitude changes in benthic d18O with the identification SST cooling to near-modern values between about 7 and 5.4 Mya by Herbert et al. (2016). Really nice finding!

Page 8, Line 31-32: regardless of the completeness of the AEB record, as you say, the absence of cycles in this record - otherwise present in your revised 982 splice - seems

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most likely be due to lack of data resolution at the former.

Page 9, lines 6-14: I would fold this important statement about MIS revision into your conclusions (and abstract) and also condense your conclusions section, which could be shorter.

Figure 4: caption needs an '(e)' inserted after 'the composite splice image for Site 982'. Also, A-E labels in the figure are capitalised, but they are lowercase in the caption. This is an issue for all figures that you may wish to rectify.

Figure 5: would be nice to have labels directly on the figure to aid the reader in quicker identification of minimal- and fine-tuning tie points without having to read the caption. Age scale on top x-axis is missing a label. I would label stable isotope data as 'benthic' on each y-axis label. Something to correct for all figures? I know its stated in the caption, but the first thing one looks at are the data in the figure!

Figure 8: red arrows showing link between 982/926 records and zoomed in interval for the AEB record are messy since they cover the numbers on the x-axis of panel B. Please redesign. I think Figure 8 could be redesigned as follows: panel A = revised 982 with 926, panel B = original 982 stratigraphy/record, panel C = original 982 with AEB, panel D = revised 982 record with AEB. Just a suggestion.

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