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Interactive comment on "Paleo Agulhas rings enter the subtropical gyre during the penultimate deglaciation" *by* P. Scussolini and E. van Sebille

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We thank the reviewer for the careful consideration of our results, and in particular for the interesting insights on the interpretation of our individual foraminiferal analysis, and we proceed to deal with each of the points raised.

With respect to the point about the G. ruber record, we agree with the reviewer that the abrupt decrease in values takes place in the early stage of termination II. Also, we agree that it is likely a result of the simultaneous decrease in ice volume and increase in temperature at the surface, compatible with the seesaw concept, and with southern hemisphere (South Atlantic) warming as a response to deglacial melt water interfering with the AMOC (Vellinga and Wood, 2002; Knutti et al., 2004), similar to what the referee notes for termination I. This is interesting, and it is indeed discussed in

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a manuscript in review (Scussolini and Peeters), and in another in preparation (Scussolini et al.). Thus, since we do not present these results here, we prefer not go at length to interpret the G. ruber dataset beyond what necessary to bolster the rationale of this study.

Regarding the discrepancies between the bulk G. truncatulinoides δ18O values and the respective mean of the individual measurements, we share the opinion of the reviewer, that indeed the only plausible explanation seems the fact that the bulk measurement is basically assimilable to a "weighted average" of the individual δ18O of each shell comprised. We show here the comparison between bulk values and the mean of the individual measurements (Fig. R2.1). Though in most cases the latter are indeed isotopically heavier than the earlier, the offset is not statistically significant (p= 0.51 with the t test for paired samples). We inserted this information in the revised Results section. We suggest anyway that a more in-depth interpretation of the varying discrepancy is not justified, and we thus opt for not jeopardizing the readability of Fig. 2 by adding this data set. On the other hand, it is interesting to note the somewhat bimodal distribution of values in samples at 142.7, 138, 133.9, 132.9 and 130.7 ka, and we thank the reviewer for pointing this out. We believe this could be indeed a reflection of Agulhas rings, or ring-flanks, conditions. Taking the suggestion of the reviewer we add this to our Results and to the Discussion.

Lastly, we are grateful to the reviewer signaling our inaccurate statements concerning the comparison of our results with the bipolar seesaw concepts, recently reaffirmed by the two cited papers, and we therefore clarify this in the revised manuscript.

Figure caption

Fig. R2.1: δ18O values of individual G. truncatulinoides sin. measurements (blue diamonds), their sample average (red lines), and of the relative bulk measurements (green triangles).

Additional references

CPD
9, C1277–C1280, 2013

Knutti, R., Fluckiger, J., Stocker, T. F., and Timmermann, A.: Strong hemispheric coupling of glacial climate through freshwater discharge and ocean circulation, Nature, 430, 851-856, doi: 10.1038/nature02786, 2004.

Vellinga, M., and Wood, R. A.: Global climatic impacts of a collapse of the atlantic thermohaline circulation, Climatic Change, 54, 251-267, 10.1023/A:1016168827653, 2002.

Interactive comment on Clim. Past Discuss., 9, 2095, 2013.

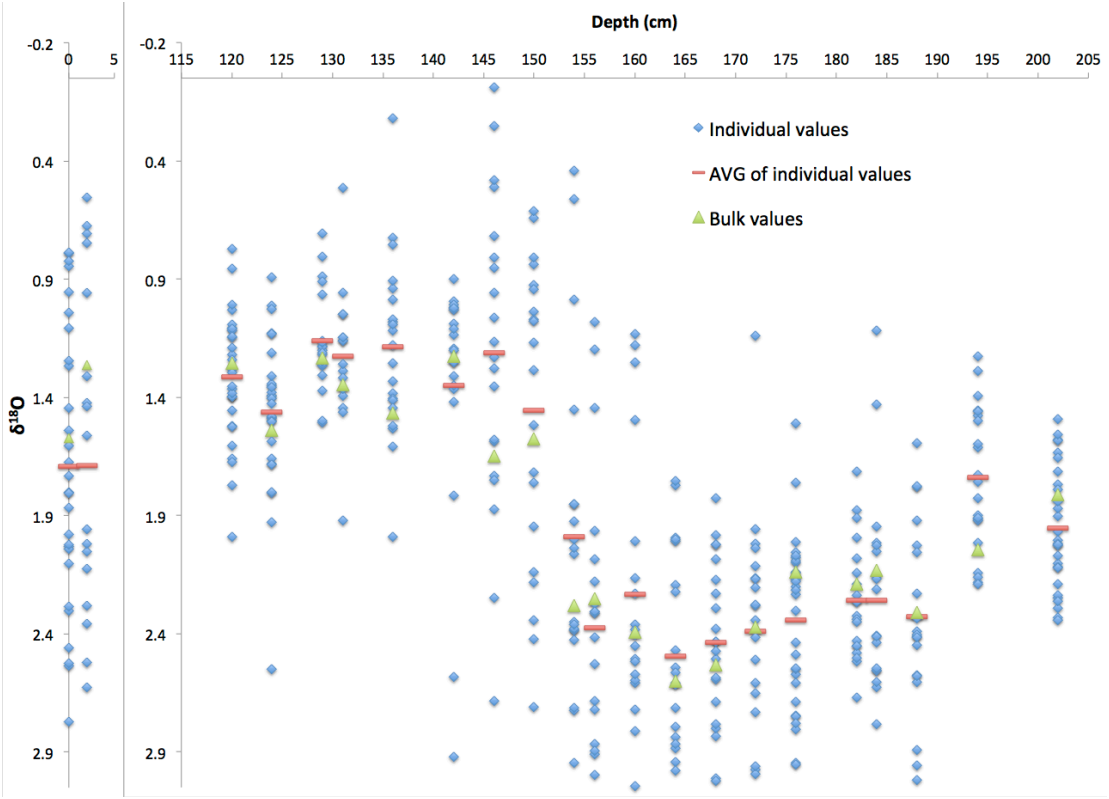

Fig. 1.

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