

## ***Interactive comment on “Glacial-Interglacial changes and Holocene variations in Arabian Sea denitrification” by Birgit Gaye et al.***

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Reply to reviewer 1:

Thank you very much for your detailed comments which will help to improve the ms. Special thanks for checking the errors in Figures, their labels, references and many small mistakes.

Page 11, lines 239-247: P178-15P is the only core for which we found a highly resolved temperature reconstruction by Mg/Ca ratios of foraminifera and from uk'37 (alkenones). Reviewer 2 has also brought to our attention that there are alkenone and Mg/Ca records for core NIOB 905 also. One of the southeastern records (MD90963; Rostek et al., 1997) is, moreover, an alkenone record and it shows a similar trend as

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the near-by Mg/Ca records. This information will be added to a revised version. The high correlation of these records does, however, not mean that all records would be comparable in the other cores and we will delete this statement (page 11, line 245/46).

Page 15, lines 332-335: We agree that we have not given enough credit to the previous work on a shift of the position of the Findlater Jet and think that this could add to the better understanding of the glacial SST pattern as well as to an interpretation of the decoupling of upwelling and moisture transport. The four suggested papers and their finding will be included in the discussion and will help to come to a more convincing explanation for the glacial/interglacial changes and the observed differences between the Oman and Somali upwelling.

As the reviewer suggests, some of the differences of the effect of NEM strength during the glacial and Holocene must be related to different circulation/ventilation patterns. As reviewer 2 has also suggested a section of water mass structure will be added and we will also elaborate on the available information on glacial mid- and deep water ventilation. We will add a model description to the Methods including further references describing the model and its application. We will add two Figures to the supplement which compare the reproduction of the OMZ in the model with WOA data.

#### Minor comments

Figure labels and core labels will be checked and made consistent.

Short introduction to  $\delta^{15}\text{N}$  will be added and the process of averaging will be further described, including the reference to the supplement.

The use of northern Arabian Sea, respectively Oman upwelling will be checked.

A more detailed description of the source of TOC MAR data will be included.

All other minor comments will be dealt with, Tables and Figures will be checked and change of Figures and captions will be done; references will be carefully checked.

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