

Dear Alice Marzocchi,

Thank you for your work on this paper. We are glad that it was accepted for publication. We are addressing the minor corrections proposed below.

Thank you for submitting your revised manuscript and addressing the remaining comments from the reviewers and myself.

I am pleased to accept your manuscript for publication in *Climate of the Past* and only requesting you to consider a couple more minor corrections/typos that I am listing below:

Line 311: "maximums" should be "maxima"
Correction implemented as suggested.

Line 375: to be a little more accurate, rather than saying "usually", modify this to something like: "as inferred from the majority of the proxy data".

And to complete this statement, add at least a few references here of studies that suggest an AMOC weakening and shoaling of the AMOC at the LGM as inferred by proxy data (e.g. Curry and Oppo, 2005) or in addition you could also refer to some other modelling studies.

We have corrected and completed this sentence as suggested:

Nonetheless, this experimental design (like all the others tested in this study) does not result in a shoaling of the AMOC between the PI and LGM state (see Fig. S5), as inferred from the majority of the proxy data (Curry and Oppo, 2005; Böhm et al., 2015; Skinner et al., 2017; Gebbie, 2014).

In addition, please note that Anne Morée provided us with the quantitative values of LGM simulated summer and winter sea-ice extent from her recent paper. We were therefore able to implement this information into the following paragraph, instead of simply referring to their supplementary figure.

In contrast, Morée et al. (2021) were able to simulate with the NorESM-OC model a shoaled and slightly weaker AMOC at the LGM compared to their PI state. As the radiocarbon ages simulated in southern source waters were too young compared to data, they however suggested that the ventilation at the LGM was still overestimated, possibly in relation to a too small Antarctic sea-ice extent in their LGM simulation (their Fig. S12, displaying a sea-ice extent of 4.94×10^6 km² in summer and 32.95×10^6 km² in winter). However, if we consider our new estimates of $\sim 10.2 \times 10^6$ km² and $\sim 32.9 \times 10^6$ km² (respectively for the summer and winter sea-ice extent inferred from proxy data), instead of the ones presented in Roche et al. (2012), the sea-ice extent simulated by Morée et al. (2021) is underestimated only in summer.