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Climate of the Past Discussions

Interactive comment on "Can oceanic paleothermometers reconstruct the Atlantic Multidecadal Oscillation?" *by* D. Heslop and A. Paul

Anonymous Referee #1

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This manuscript presents very interesting modeling results to assess the ability of ocean paleothermometers to capture surface and subsurface temperature variability associated with the AMO, using the Uvic Earth System Climate Model. With a prescribed AMO-like fluctuations in the Atlantic, the model results suggest that the coral-based proxies of SST might be capable to reconstruct the past AMO with adequate signal-to-noise ratios, while the sediment-based proxies would likely to yield low signal-to-noise ratios. The approach used in the manuscript is very innovative, and the result is very useful for guiding paleo reconstruction of the AMO signal at various locations in the surface and subsurface North Atlantic. The work will attract wide interests in communities studying climate variability and the reconstruction of the past variability. The

manuscript is well presented, and I recommend the paper to be accepted for publications in Climate of the Past after some minor revisions outlined in the following review comments.

1, Fig. 2 shows the leading EOF of the AMOC. It would be very interesting to add a plot of the time series of this leading mode (PC1) and compare it with the modeled AMO Index. Are they in phase with each other at low frequency?

2, Fig. 5 shows a vertical section of Sˆmax as a function of latitude. Is it the zonal averaged value in the North Atlantic? The expression "Meridional averaged" in the caption is confusing.

3, It would be helpful to add a table to list the estimated s values (error) of various paleo proxies for comparison.

4, Is it possible to apply similar approach to assess the signal-to-noise ratio of the tree ring records over land by comparing the modeled air temperature anomaly over land associated with the AMO forcing?

5, It worth to emphasize in the abstract that the results are dependent on the particular model used.

Interactive comment on Clim. Past Discuss., 6, 2177, 2010.