

**Referee comment on ‘Sea surface temperature evolution of the North Atlantic Ocean across the Eocene-Oligocene Transition’ by Śliwińska et al.**

In light of previous comments, the authors have done a good job addressing most issues while sticking to the important information. It is now clear that this paper focusses on the proxy record of North Atlantic SST, trying to explain some of their observations to the results of climate models but leaving a more in-depth discussion of the latter outside of its scope.

Language has been improved, with some errors remaining mostly due to textual changes made that should be resolved in a final sweep.

The main issue remains with readability/clarity of some of the figures, which I feel are not addressed properly. Some of the choices were explained in the authors’ response, but little to no adjustments were made;

- Figure 4: there is too much information stacked on top of each other, using different colours, boxes and lines. I don’t see much added value showing present-day SSTs (unless this serves as e.g. a model reference), yet using this over an anomaly with respect to PD uses about half of the figure. As it is now, it is also not clear to me what the main message is to the reader; the difference between the time intervals, with respect to the present, or rather which model simulation performs best?
- Figure 5: is a nice addition, but many of the trends are obscured by the large shifts during the asynchronous coupling phase. Consider leaving out the first ~3300 years, or splitting the figures into 2 parts adjusting the vertical axes. For consistency, it would be nice to colour-match the simulations throughout the different figures.
- Figure 6 (was 5): This is indeed a useful figure, but it does not serve its intended purpose well because of the very subtle colour scale and large range. In its current format, a certain proxy SST can easily be off by 4C or more and barely be visible. I suggest using a different colourmap and/or narrower temperature range such that the differences between both proxy and model SSTs are clear for the different scenarios.
- Figure 8 (was 7): I agree that the BSF is a very useful measure and that it should be depth averaged. Maybe my point was a bit unclear and was rather meant to take care in interpreting what is shown. The discussion of this figure mainly aims to explain part of the SST changes through current changes and the extent of SP/ST gyres. As the gyre contributions are likely quite weak at this point in the North Atlantic, the differences between both figures are probably mostly AMOC transports. Therefore, the link between SSTs and changes in depth-integrated transports as well as gyre extent is therefore in my mind not easily made based on the results shown.

**Minor comments:**

- L280 and following: SST proxies are still referred to as observations here.
- L360: This is confusing; insufficient polar amplification would mean too cool rather than too warm polar temperatures? Figure 5 also shows that the simulations are underestimating rather than overestimating high latitude temperatures, in contrast to what is mentioned here. Additionally, 'polar' temperature is somewhat of an unlucky term, as all of the proxies considered are near or equatorward of the Arctic Circle. Use 'middle/high latitude' instead?
- Section 5.2: The authors suggested to add further information on the meridional overturning stream functions and SST of deep water formation regions. Much of this section was adjusted and a figure showing AMOC timeseries has been added. If there is any additional information and/or analysis in the supplement, there is no mention or reference here.