

## Responses to Anonymous Referee #1

### **RC1:**

The authors provide a nice western Pacific warm pool planktonic foraminifera oxygen isotope during the past 800 ka with novel stack method. This is important and timely for further paleoceanography studies in this region. There are just a few minor points I would like to ask the authors to address.

Lack of references in the introduction section

In the introduction section, the authors largely rely on only very few references (Lea et al., 2000 and Tachikawa et al., 2014) to present some basic description of western Pacific warm pool region. Although these 2 references are crucial and important, however, these are definitely not modern physical oceanography papers. If the authors would like to make the reference list be more concise, then perhaps the authors could add “and references therein” to clarify is not just these 2 references for the whole previous physical oceanography studies in the warm pool region. Or the better way, to cite some physical oceanography observational papers in the first 2 paragraphs of introduction section.

We agree with the reviewer that the introduction section does not have a sufficient number of references. The revised manuscript will have additional references, including more modern oceanography papers pertaining to the region such as the following:

Broccoli, A. J.: Tropical cooling at the Last Glacial Maximum: An atmosphere–mixed layer ocean model simulation, *J. Clim.*, 13, 951–976, [https://doi.org/10.1175/1520-0442\(2000\)013<0951:TCATLG>2.0.CO;2](https://doi.org/10.1175/1520-0442(2000)013<0951:TCATLG>2.0.CO;2), 2000.

De Deckker, P: The Indo-Pacific Warm Pool: critical to world oceanography and world climate, *Geosci. Lett.*, 3, <https://doi.org/10.1186/s40562-016-0054-3>, 2016.

Lo, L., Chang, S.-P., Wei, K.-Y., Lee, S.-Y., Ou, T.-H., Chen, Y.-C., Chuang, C.-K., Mii, H.-S., Burr, G. S., Chen, M.-T., Tung, Y.-H., Tsai, M.-C., Hodell, D. A., Shen, C.-C.: Nonlinear climatic sensitivity to greenhouse gases over past 4 glacial/interglacial cycles. *Sci Rep*, 7 (1), 4626, <https://doi.org/10.1038/s41598-017-04031-x>, 2017.

Mayer, M., Haimberger L., Balsaseda M. A.: On the energy exchange between tropical ocean basins related to ENSO. *J. Clim.*, 27, 6393–6403, <https://doi.org/10.1175/JCLI-D-14-00123.1>, 2014.

Neale, R., and Slingo, J.: The maritime continent and its role in the global climate: A GCM study. *J. Climate*, 16, 834–848, [https://doi.org/10.1175/1520-0442\(2003\)016<0834:TMCAIR>2.0.CO;2](https://doi.org/10.1175/1520-0442(2003)016<0834:TMCAIR>2.0.CO;2), 2003.

Rosenthal, Y., Oppo, D. W., Linsley, B. K.: The amplitude and phasing of climate change during the last deglaciation in the Sulu Sea, Western Equatorial Pacific, *Geophys. Res. Lett.*, 30 (8), <https://doi.org/10.1029/2002GL016612>, 2003.

Wefer, G. and Berger, W. H.: Isotope paleontology: Growth and composition of extant calcareous species, *Marin. Geol.*, 100 (1), 207–248. [https://doi.org/10.1016/0025-3227\(91\)90234-U](https://doi.org/10.1016/0025-3227(91)90234-U), 1991.

Figure 1: what is the software to make this figure? The authors only mentioned the reference for SST dataset.

A description of figure 1 (core locations and SST map) has been added that will read, “Figure 1 was created with MATLAB’s geoshow() function from the mapping toolbox (The Mathworks Inc., R2022b).”

Line 78-80, should be “30 m” and “20-75 m”; Also, although the original reference from Chuang et al. (2018) used “G. sacculifer”. The genus name has been revised as “Trilobatus sacculifer; T. sacculifer”.

Corrected.

Table 1: I wonder why the authors did not include Medina-Elizalde et al. (2005)’s ODP 806 data?

This data was overlooked during the original stack construction. The Medina-Elizalde ODP 806 data has been added to a new version of the stack that will be used in the revised manuscript, with references added in Table 1, the Figure 2 caption, and the reference section.

Also, “180-1115B” data should be “ODP 1115B”, please revise it through the text, figure 1, and Tables.

The core name was updated and made consistent throughout the text and figures.

Lastly, Lo et al. (2017) only report data back to 350 ka, but the dataset of MD05-2925 here is back to ~462(?) ka. Please clarify.

Additional data for MD05-2925 was used from a data set published by Lo (2021), but the citation was missing in the original version of the manuscript. The reference was added in the main text, Table 1, and the reference section.

Lines 128-130, please describe why the authors would like to set the reservoir age as zero?

The Marine20 calibration curve uses a model estimate of time-dependent global mean surface reservoir age, which is ~400 yr for the Holocene and increases to 800-1000 yr for 20-50 kyr ago. We set the reservoir age offset ( $\Delta R$ ) for our sites to 0 yr, meaning we did not change the reservoir age from the time-dependent Marine20 default. Additional description has been added to clarify that a reservoir age is still being used, as well as added notation for the reservoir age offset ( $\Delta R$ ).

Line 150, should be “29°C”

Corrected in revised manuscript.

Lines 186-187, if the authors take the uncertainty into account would the 1.3 permil significantly different from 1.7-1.8 permil glacial/interglacial changes? Please clarify.

The reviewer provides an excellent suggestion here. We will use the stacks' estimates of  $\delta^{18}\text{O}$  uncertainty for each glacial and interglacial stage, to calculate an uncertainty estimate for the mean amplitudes of  $\delta^{18}\text{O}$  change across TI-TV for both the planktonic and benthic stacks and include it in the revised manuscript.

Section 6.1, perhaps the authors could also refer to cores used in this study with both benthic and planktonic foraminifera  $\delta^{18}\text{O}$  stratigraphy. For example, MD05-2925, Lo et al. (2017) several other reports in this core have reported there is no clear timing differences for the past 5-6 terminations (Liu et al., 2015, Lo et al., 2022).

Thank you for directing us to those studies. We have added information about planktonic/benthic age offsets from other publications as well as a qualitative comparison of planktonic and benthic records from 3 of the WPWP cores included in the new stack for which planktonic and benthic  $\delta^{18}\text{O}$  data have been published (MD05-2925, ODP 1143, ODP 806). Figures comparing planktonic and benthic  $\delta^{18}\text{O}$  plotted versus depth in these 3 cores will be added as supplementary material.

The title of Figure 7 is not clear, what kind of “contributions” that the authors would like to address in this figure?

The figure 7 caption has been modified to clarify that the figure shows the estimated ice volume and temperature contributions to planktonic  $\delta^{18}\text{O}$ .