

Thank you so much for your comments.

Our point-to-point responses are as below.

The original review comments are shown in [blue](#), and our responses in **black**.

Please consider the use of mid-Pliocene throughout the manuscript and whether it is stratigraphically correct.

A: We agree on it and changed mid-Pliocene into mid-Piacenzian in this manuscript.

BP to denote before present is also perhaps unnecessary here as it refers specifically to radiocarbon dating with present being 1950.

A: We changed it into “3.264 to 3.025 million years ago” to keep consistent with Haywood et al (2020).

Line 111 - what are [the](#) characteristics...

A: We made the correction.

Line 117-119 - Wording is a little off. Please consider rephrasing second part of question: How can we deal with the effect of any bias duplication from models within the same 'family' within our analysis?

A: We rephrase it into “How can we account for the effect of any bias duplication caused by models from the same 'family' within our analysis?”.

Could reference Table 1 on line 131 and remove sentence on 139 that says: Refer to Table 1 which shows the components used in the PlioMIP2 Models.

A: We removed sentence on 139 and put “(Table 1)” after the end of line 131.

Line 161 - the map is quite small in the version of the manuscript online, it is not easy to see the ocean gateways - can you please make the left-hand map larger in the final figure upload.

A: We updated this figure.

Line 164 - there is still a ? Within the sentence, so it looks like there is missing information - please correct.

A: It is a reference. We corrected this error.

Line 200 - perhaps the word should be compare rather than confer?

A: We deleted the unnecessary word “confer”.

Line 227 - For example, at site ODP1143, which has both UK37 and Mg/Ca data available, Mg/Ca suggests a negative SSTA [mid-Pliocene versus preindustrial, result](#) from this proxy is not supported by alkenones.

Please consider the phrasing here - I am not sure what is meant by a negative SSTA mid-Pliocene versus preindustrial. Perhaps you don't need mid-Pliocene versus preindustrial as this is inferred in the Anomaly part of SST?

A: We agree. We deleted “mid-Pliocene versus preindustrial”.

Line 250: [show](#) that reconstructed....

A: We made the correction.

Line 254: we use Monte-Carlo simulations following a similar method used in Kageyama et al. (2021).

A: We rephased it into “we use Monte-Carlo simulations following a similar method to that used in Kageyama et al. (2021)”.

Line 262: Here we use letter E to denote discrepancy. I think this is not needed as you already refer to the proxy discrepancy median value (E) in line 254.

A: We deleted this line.

What is the figure on page 3 of the supplementary information? It has no legend and doesn't look like it is connected to Fig. S1 or Fig. S2

A: We added caption to this figure.

Line 288 - I am not sure you have previously defined P-E or SOS.

A: We defined P-E and SOS in the end of the Introduction. For the track-changes file, it is Line 100.

Please check the clarity of figure 4 in the final manuscript carefully. I think the ODP labels and the site numbering for panel b might be difficult to decipher.

A: We added semi-transparent background for ODP labels. For site numbering in panel b, we bolded the label.

Line 301 - which representing the 3 largest warm anomalies needs correcting to either representing the 3 largest warm... or which represents the 3 largest warm....

A: We made the correction.

Line 309-311 referencing the Dong et al 2020 paper would benefit from re-writing as I am not clear of the point that is being made.

A: We rephased this sentence into “With the regard to warming of the WPWP in CMIP6 models, the MC contributes to the climate feedback differences, besides the effect of the MC, there is a stronger sensitivity of extratropical clouds to surface warming that may also result in differences”.

Line 326: From hatching and black lines in Fig. 4b, the difference in the distribution of land and sea in the Eoi400 and the E280 simulations is evident. Would be useful if you refer to what the hatching and black lines denote here to help the reader.

A: We made this correction.

Caption for Fig 7 - positive values indicate westward transport

A: We made this correction.

Fig. 10 - please consider the scale on the colour bar

A: We redrew the scale on the colour bar.

Line 507: Changes in the WPWP have a direct effect...

A: We made this correction.

Line 526 - impact of ENSO on the Indian Ocean

A: We changed this sentence into “The ITF can transfer the signal of ENSO to the Indian Ocean and further afield.”

Page 30 and Section 4.2 - there are five uses of on the one hand/other hand. Please consider alternative phrasing for this section.

A: We deleted some unnecessary “on the one hand/other hand” and replaced some with other words.

Line 608: As in CMIP6 , also PlioMIP2, not all the models are independent from each other. - consider rephrasing to "In PlioMIP2, as in CMIP6, not all models are independent from each other".

A: We made this correction.

Line 657: remove the 'on the one hand' and 'on the other hand' here. It is not needed.

A: We made this correction.