RC2

I find the manuscript well written and the scientific arguments are sound and well presented. Overall, this work qualifies for publication and I suggest here a few points that could improve the quality and description even further.

Specific points:

Line 40: As it has been argued that the mid-Pliocene is an analogue of the near future climate, it needs to be clarified here that the behavior of the AMOC is different in present to future climate in the climate model simulations (a declining AMOC) compared to what the PlioMIP2 models are showing (intensified AMOC). AMOC plays a key role in our climate system and therefore its direction of change under enhanced CO_2 is crucial.

Agreed. The response of AMOC, but also of other features in the climate system, is not the same between the (near)future and as assessed in the Pliocene /PlioMIP2. We will add a sentence at the end of this paragraph (L45): **"Not all of these features are analogous to (near-)future climate projections, e.g. AMOC is projected to decrease while the mid-Pliocene AMOC is simulated to be strengthened (IPCC, 2021)."**

Line 69-70: do you mean here that the ENSO variability change in future is different from the one we find in PlioMIP2 simulations, where it's seen to be decreasing? Again, later in the paragraph at line 74-75 you mention that at high CO_2 forcing a weakening of ENSO variability is found. How do you reconcile these two parts? Why do they reach different conclusions. Could you give some hypothesis here? And how this present study helps in this context. Overall, I think this paragraph needs some more thought and work to make it not confusing and clearer.

Thanks for this remark. We acknowledge that the current paragraph might be confusing to a reader. What we mean to communicate is first that **near-future** ENSO projections show increased variability, but with large uncertainties. Then, we want to highlight that long term equilibrated simulations actually show a suppressed ENSO. This is similar to the PlioMIP2, meaning that studying the PlioMIP2 ENSO teleconnections could be useful for long term future ENSO projections, but maybe not for near-future ENSO projections. We will change and add parts to this paragraph as follows (below follow all sentences including changes in **bold**:
  - "What may happen to ENSO and its teleconnections to the North Pacific in the **near-**future under global warming is unclear."
  - "It is likely that ENSO precipitation variability will increase (Cai et al., 2021; Yun et al., 2021), and that variability of ENSO and atmospheric teleconnections including AL variability will increase in the near-future (Chen et al., 2018; Fredriksen et al., 2020; Cai et al., 2021)."

- "However, uncertainties are very large, in part due to internal variability**, and conclusions become even less robust towards the end of this century** (Fredriksen et al., 2020; Beobide-Arsuaga et al., 2021)."
- "Additionally, ENSO teleconnections can also change because mean atmospheric circulation will change, regardless of ENSO change (Yeh et al., 2018)."
- "**In the long-term, idealised future warming simulations under equilibrated high CO$_2$ forcing, however,** suggest a weakening of ENSO variability (Callahan et al., 2021; Zheng et al., 2022)."
- "**This is similar to what is found in the PlioMIP2 (Oldeman et al 2021, Pontes et al 2022), implying that the mid-Pliocene ENSO response is similar to what could be expected in an equilibrated high CO$_2$ future, but not similar to the near-future ENSO response.**"
- "This makes the mid-Pliocene **a valuable** test case to investigate the response of North Pacific variability to a suppressed ENSO."

Line 103: the term 'sufficient amount' sounds vague to be in a scientific journal. If on average the range of number of years can be specified that would be better.
Agreed. We will change the sentence to: "... have been run for **thousand or more model years (following the PlioMIP2 protocol) and can be** considered in climatological equilibrium."

Line 126-127: I wondered if the author needs PDO to be the part of this manuscript as the PDO and its connection have rarely been explored in this study and at the end, author's schematic shows that there is another work focusing on PDO that is in prep. I would recommend that author can leave the PDO totally out of this paper. It's not at all required for the point that the author makes in this paper.
Thank you for this remark. Indeed, the PDO is not a focus of this research and in fact it is only mentioned in the Discussion and in the schematic Figure 8. Since it is a relevant mode of variability in the context of ENSO and AL variability, we will keep the PDO mentions in the Introduction and Discussion, but we will move all the explanation regarding the PDO (i.e. in L126-127 and in L136-140) from the main paper to the Supplement. This is because results on the PDO are included in the Supplementary material (Figure S1).

Line 239: In the entire paper, I got confused between the terms multi-model-mean and ensemble mean which I think are used in the similar meaning. I would recommend to stick to one term. Either multi-model-mean (which I would prefer) or ensemble mean (I would not prefer this as it usually denotes means of multiple ensemble members of a single model and doesn't really clarify that multiple models are involved in the construction of the mean).
Thanks for this remark. We agree that this can be confusing currently, and we will stick with multi-model mean (MMM) throughout.

Line 254: I think such correlation is just happening by construct. It's the part of the AL variability related to ENSO to begin with. Therefore, by construct they are supposed to be having high correlation. That needs to be mentioned too.

Thank you for this remark.
- This is not entirely true. This argument does hold for any correlation between ENSO and the AL variability that regresses with ENSO. But it does not necessarily hold for the correlation between the model-dependent changes in variability.
- We understand this can be a bit confusing for a reader, so we propose to add the following sentences in between the sentences in L255: "**We could expect the ensemble correlation in Figure 6a to be higher than the ensemble correlation in Figure 2c if the linear regression between ENSO and the AL would be the same between the pre-industrial and mid-Pliocene. While the multi-model mean regression is largely unchanged (Figure 3b), the regression change per model can be substantial, implying that the correlation in Figure 6a is not necessarily higher merely by construct.**"

Line 304: Typo- it should be 'on the one hand'
Yes, we will change "one the one hand" to "**on the one hand**"

Line 317-318: Framing some questions at the end of introduction and then answering them in discussion or conclusion is understandable but framing a new question here in the discussion for the readers seemed a bit odd to me. Please frame it as a topic to be explored further or a question that yet to addressed.
Agreed, we will change this so that it is not a question. We will rewrite as follows: "**In this section, we will explore the residual Aleutian low variability in more detail, and hypothesize what its change might be related to.**"

Line 333-334: need a reference here regarding the statement made here.
L332-334 is meant to summarize that what is explained in the sentences before. Hence, we don't think that this sentence would merit a reference. However, we acknowledge that the current phrasing might be confusing and could be read as a new statement. So, we will change the current sentence in L332-334 to the following: "**In conclusion, since there is considerable model spread both in changes in ENSO skewness and kurtosis (Oldeman et al. 2021) and in the ENSO-precipitation relation (Pontes et al 2022 and Figure 4c this study), non-linearity in the atmospheric response to ENSO could explain some of the residual AL variability but the exact contribution is likely model dependent.**"