First of all, we would like to thank the reviewer for their comment on our revised comments. The reviewers' comments are shown in bold, while our answers are shown in regular font-type.

I acknowledge the authors for their work on this revised version of the manuscript. The readability of the manuscript, particularly in the results and discussion sections, has been significantly improved, and the content is now more focused and specific. Additionally, the authors conducted further simulations that clarify some of the key results. They have also addressed the role of CO2 during the MPT, which was not clearly defined in the initial version of the manuscript. In my opinion, the paper is almost ready for publication.

My only remaining minor concern is the lack of explanation regarding the authors decision to focus solely on "frequency changes" in the MPT. While I appreciate the challenges models face in accurately representing both the amplitude and frequency of the MPT, I would advise caution in treating these two parameters as entirely independent. Including a brief statement acknowledging that all results and interpretations related to MPT frequency are based on simulations that do not capture its amplitude would provide important context and ensure fairness in the interpretation of the findings.

We added a statement to the discussion section that our results may be influenced by the lack of substantial amplitude change. We put this limitation in the context of one of our other results: the threshold for ice sheet collapse depends on the ice volume and climate forcing (See line 357-359).

In conclusion, I congratulate the authors on the large amount of work produced in their study, which provides valuable contribution to the understanding of the mechanisms at the origin of the MPT.

We would like to thank the reviewer for their comments on our revised comments. The reviewers' comments are shown in bold; our answers are shown in regular font-type.

Clarification of the Regolith Hypothesis: The methodology for idealizing changes in basal friction is somewhat unclear. It would be beneficial to explicitly state how the experimental setup reflects real-world conditions and what assumptions underlie it.

We added a few sentences at line 217 to clarify the method used for this reduced friction simulation. We emphasized that our method is a simplistic test for decreased friction during the Early Pleistocene.

Detailed Explanation of Model Settings: The methods section relies heavily on citations without sufficient detail on basic model settings. For example, the statement that ocean temperatures "do not vary spatially within a model domain" needs further clarification to aid reader comprehension.

We added a few elaborations in the method's section:

We specified the basal sliding method and added a reference in line 111.

We explained that the sub-grid friction scheme could capture Marine / Proglacial ice sheet instability (line 120).

We more clearly stated that the ocean temperatures are homogenous and are interpolated with respect to CO_2 and insolation (see line 124).

In lines 127, we specified that the snow-rain partitioning scheme is temperature-based, and the amount of refreezing is limited to the available liquid water, temperature and firn depth.

Stronger Conclusion and Contribution: The key takeaway of the study in relation to previous research remains somewhat ambiguous. Clarifying whether the study primarily challenges the conventional role of orbital forcing, emphasizes phase-dependent importance of CO_2 and insolation, or highlights interglacial CO_2 thresholds as a key driver of glacial cycle lengthening would significantly improve the impact of the conclusions.

We have decided to rewrite the conclusion section to clarify our key takeaways. To improve clarity, we have summarized our conclusions using bullet-points. Additionally, the conclusions section now mainly focuses on the threshold behavior between CO_2, insolation and ice sheet volume. In the introduction, we also added a brief statement that our study is the first one that conducted ice-sheet model simulations using the Yamamoto et al. (2022) dataset (see line 97).