

Dear editor and reviewers,

We thank you for catching the typos and suggestions on rephrasing the manuscript. Please see the below point-to-point response and the revised manuscript.

Sincerely,
Yan-Ning Kuo, on behalf of the coauthors

Reviewer #1

Dear the authors,

Thank you for considering all comments and suggestions made by the reviewer. I believe all points raised in the first review have been addressed sufficiently. Therefore, I'm happy for this study to be published on the Cryosphere.

Kind regards,

Technical comments

L56: It should be "projected onto Greenland blocking pattern" as the authors mentioned in their response.

We've revised L56 as the reviewer pointed out.

L278: I would refer to Figure S9a after the "significant correlations of an emerging Greenland blocking pattern in GHG".

We refer Figure S9a after this sentence as suggested by reviewer and change the reference to "Figure S9" in the end of the sentence to "Figure S9a vs Figure S9b."

L320-322: Although uncertainty from snow parameterisation is smaller compared to uncertainty in other atmospheric variables, it still contributes to the overall model errors. I suggest the authors rephrase those two sentences to avoid misunderstanding.

We revised L320-322 as: "The snow parameterization uncertainty contributes to part of the high model structural uncertainty in SMB but does not serve as the main contributor (Holube et al., 2022)."

Reviewer #2

I thank the authors for their careful and thorough revisions. They have addressed my previous comments clearly and comprehensively. I appreciate the additional analyses and clarifications, which have substantially strengthened the manuscript.

I believe the manuscript is suitable for publication subject to minor technical corrections listed below.

2nd paragraph in Section 3.4: It seems that the following sentences, which exist in the reply and the tracked changes file, are missing in the revised manuscript file?

"However, in GHG, the Atlantic Meridional Overturning Circulation (AMOC) declines more rapidly than in ALL, as it lacks the offsetting North Atlantic cooling from AAER 4 (Figure 9 in Simpson et al., 2023), leading to cooling in the Subpolar Gyre. Additionally, ALL-forced JJA Z500 increases with a blocking-like structure over Greenland, while GHG-forced JJA Z500 increases more uniformly (Figure 5b vs Figure 5c contours). A cooling of the Subpolar Gyre in GHG simulation and a stronger subsidence trend in ALL together lead to less warming in GHG than in ALL (Figure 5b vs 5c)."

[Thank you for catching this missing paragraph. We've corrected this in the main manuscript](#)

L239: "over the GrIS"

["The" added.](#)

L286: the format of citation should be corrected: Maddison et al. (2024)

[Corrected.](#)