We sincerely thank the referees for reviewing our revised manuscript and providing additional useful suggestions and being willing to review the revised manuscript en route to the final publication of this work. We have incorporated all the new comments as presented below. We leave the reviewers' original comments in black text and write our response in blue text. Quotes from the manuscript are in blue *italics*, and new edits made in the revised manuscript are blue **bolded** text.

Reviewer 1's comments and suggestions for revision:

The authors have thoroughly addressed the comments and provided clear answers, this is appreciated. The newly added figures 9 and 10 help to support the conclusions. I have a few remaining small comments that can be easily addressed. I look forward to seeing the paper published.

1. Track changes version line 591: "simulations over the last glacial cycle require a coupling time of hundreds of years" This is a strong conclusion that does not always hold; in your answer you say "one can choose only one time interval for the entire last glacial cycle" So the coupling time of hundreds of years is required probably because this time is required in part of the deglaciation. But if different time steps would be possible as you suggest in line 1112, you wouldn't need a coupling time step of hundreds of years in the glaciation phase. It would be good to point that out because the conclusion as it is phrased now could stick with the reader as a general conclusion.

We have made changes to the sentence to clarify that the time resolution of hundreds of years are needed in NHIS coupled simulations to capture ice sheet – sea level -solid Earth interactions during deglacial phases. The sentence (in L319 of the revised manuscript) now reads as follows:

"These results suggest that ***if the model is only capable to assign a uniform temporal resolution****, Northern Hemisphere coupled simulations over the last glacial cycle require* ***a resolution of*** *hundreds of years* ***to maintain the coupling interval short enough*** *to accurately capture the interactions between the ice sheets, bedrock elevation and sea level* ***during deglacial phases (see the divergence of the non-black lines after the strong deglaciation at ~ 80 ka in Fig. 3a.)****"*

2. Figure 7 has a caption from another document at the bottom of the figure.

We have deleted the part from the figure.

3. Figure 8: is this also a cross-section along the red line in figure 6g as figure 10? That could be added to the caption.

We have added it to the caption of Fig. 8: *"Figure 8: Elevations of the ice sheet and topography across the grounding line in the West Antarctic region* ***(red line shown in Fig. 6g). …"***

4. Figure 10 is similar to figure 8 and figure 9 has similar subfigures as figure 6, but reading the captions from figure 9 and 10 it is not immediately clear what the key difference is. After going through part of the text again I was reminded again but perhaps the reader can be helped by making it more obvious in the caption of figure 9 and 10.

Figure 9 and 10 show similar figures to Figs. 6 and 8 but are based on coupled ice-sheet – sea-level simulations as opposed to standalone sea-level simulations. Since Figs. 9 and 10 already writes that their results are from coupled simulations, we have clarified the cation of in Figs. 6 and 8 instead to mention that they are based on a standalone sea-level model:

Figure 6 caption now writes: "*Changes in Antarctic Ice Sheet volume and thickness over 550 years from* ***DeConto et al. (2021)*** *and* ***associated*** *total sea-level changes* ***predicted by a standalone (uncoupled) sea-level simulation****."*

Figure 8 caption now writes: *Elevations of the ice sheet and topography across the grounding line in the West Antarctic region* ***(red line shown in Fig. 6g)*** *and the sensitivity of predicted topography to temporal resolution in standard and time window simulations* ***based on a standalone (uncoupled) sea-level model."***

5. Figure 10d and g: instead of 'vs' the label (or figure caption) could maybe say one minus the other as in figure 8d.

We have changed 'vs' to the minus symbol '-'. We have also incorporated this suggestion in our Figure 9.

6. 121: add "the" before "pseudospectral method"

Change has been made as suggested.

7. 268: sentence doesn't flow nicely

We have clarified and shortened the sentence, which is in L167 in the new revised manuscript.

8. 972: add "the" before "West Antarctic region"

Change has been made as suggested.

9. 1061: add "the" before "high-frequency"

Change has been made as suggested.

10. 1319 change "the in" to "in the"

Change has been made as suggested.