

Dear Editor and Reviewers,

thank you for your careful assessment of our manuscript once again. We appreciate your care in improving our manuscript and making our central message more explicit.

We accept and we performed all the minor corrections that you suggested, and reviewed the clarity and conciseness of the entire text, trying to sharpen the central message. In particular, we would like to comment here in more detail about this issue:

"L337: This makes me wonder why the two estimates are different, when it is supposed to be the same model? It would be good to add a sentence explaining this."

We thank you for the insightful comment. Fortunately the Editor, being the author of Original-Glabtop2, gave us access to the source code of the algorithm, and we could compare the two Glabtop2 codes. We understood that probably it is due to the different interpolation method, different number of random cells selected to calculate ice thickness, different buffer zone to assign fixed thickness at the glacier margins. The core method and parameters are the same, but the implementation is slightly different in the interpolation, providing, actually, quite different results. So... it's not only the algorithm itself, but also side aspects of it, such as the interpolation to the glacier margins, that influence the results, and in a non negligible way! We added this explanation to the discussion.

We report Reviewer #2 comments in the following:

I appreciate the detailed responses to the reviewers. I previously recommended publication, and I continue to believe that the manuscript is suitable for publication after a few minor edits in the newly added text (see comments below).

Regarding the concern raised by the other reviewer about potential circularity in the method, I agree that this is an important point to clarify, but in my view the issue is not as severe as suggested. The authors use model outputs from well-established, state-of-the-art models to aid the interpretation of the GPR data. These model results convincingly support the interpretation that the shallow scattering horizons are unlikely to represent the true bed. Without this modelling context, the GPR data could be misinterpreted, and the resulting GPR-derived ice-thickness estimates might then be used to constrain a subsequent model in a way that would introduce significant errors. In this case, using the model estimates prior to GPR interpretation helps to avoid such misinterpretation and, in my opinion, is a defensible and useful approach.

That said, I think the authors could sharpen how this argument is presented. Some paragraphs are quite lengthy, and the central message (modelling is used to avoid misinterpreting shallow reflectors as bed) does not always stand out clearly. I suggest tightening the relevant sections and making this key point even more explicit.

Overall, the language of the manuscript could still be improved (e.g. for clarity and making it more concise).

In summary, I recommend acceptance subject to some minor revisions (see comments below + potential language editing to improve clarity).

Line-by-line comments

L11: re-word to e.g. "... on the same glacier, which highlights the difficulty in identifying the true bed reflection."

L266: remove "probably"

L276: I suggest rewording to e.g. "Therefore, additional information of the bedrock topography is helpful. This information came from..."

L294-L296: Reword to e.g. "The reader is strongly encouraged to look at those GPR profiles and model estimations, ..."

L312-318: There is quite some repetition in this paragraph, and without much additional information than what is already in the discussion. I suggest rewording to: "We focus on the specific challenge of scattered and unclear GPR data on temperate glaciers and evaluate how ice-thickness models can help interpreting such datasets."

L337: This makes me wonder why the two estimates are different, when it is supposed to be the same model? It would be good to add a sentence explaining this.

L389: Rephrase to "... On the Rutor glacier, it is likely the combination of all these that challenge the visibility of the bedrock reflection".

L393: I suggest rewording to: "By using the constrained GlaTE model rather than only interpolation, better informed ice-thickness estimates can be made in areas not surveyed by GPR."

L421-425: I'm not sure that this belongs in a scientific paper, and would consider removing it.