

Interactive comment on “Modeling the Greenland englacial stratigraphy” by Andreas Born and Alexander Robinson

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We thank reviewer Holschuh for the thorough evaluation and detailed suggestions. We agree with the characterization of our manuscript as more of a methodological paper and that this calls for a thorough technical description. This is a very useful comment, because we originally understood the previous publication (Born, 2017) as the primary technical reference and the present manuscript as a first application. However, it is true that the coupling between the layer tracing scheme and the physical host model is not trivial and warrants a more detailed and reproducible description. Related to that, we also plan to make our source code publicly available upon acceptance.

Seeing that the comments on the technical work are minor, we plan to revise our

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manuscript following the three suggested primary changes:

1) A reproducible description of the coupling with the host model in Section 2.4. In addition to extending the written explanation, we propose adding a flowchart to illustrate how and when information flows.

2) A more succinct description of the results. This means that in addition to extending Section 2.4, we will reduce the descriptions of figures 4, 5, 10, 11 where possible.

3) A discussion of how our work relates to ongoing studies of fitting isochronal surfaces in dynamically active regions. We also agree that the manuscript would greatly benefit from a discussion of recent efforts to use isochronal layers as constraints for dynamical processes near the margins, although this is not the focus of our work. In addition to the dynamic shortcomings of our coarse-resolution model in these regions, the isochronal grid does currently not allow for folding, i.e., a non-monotonous increase of age with depth. This will be clarified in the revised methods section. We are working toward the application of the layer tracing scheme to dynamically active regions, but this will require further development work to improve, e.g., the numerical efficiency. This information will be included in the revised text.

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