

The Cryosphere Discuss., author comment AC1
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Reply on RC1

Katharina M. Holube et al.

Author comment on "Sources of uncertainty in Greenland surface mass balance in the 21st century" by Katharina M. Holube et al., The Cryosphere Discuss.,
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We would like to thank the Anonymous Referee #1 for the constructive review. We agree with the referee that observational data could improve the parameters of the snow model. However, in a non-ideal world, multivariate calibration will always give several possible optimal solutions (Zolles et al., 2019). Further, we would like to keep the discussion of the parameter tuning short because it is subject of the work by Zolles and Born (2021). A detailed discussion of the BESSI parameter uncertainty could distract from the primary goal of this study, to quantify the uncertainty arising from different plausible climate simulations.

Using a different bed topography such as BedMachine v3 does not change our results because our model does not simulate ice dynamics. We will compare the topography used so far (ETOPO) with the more recent surface topography reconstruction by Schaffer et al. (2016), but do not expect major differences, because our key results are based on relative differences.

We further plan to revise our manuscript by

- (1) providing additional detail on the simplified horizontal mass flux and its importance for our results,
- (2) estimating the error made by running all different parameter combinations with the same equilibrium snow spinup, and
- (3) improving the text and the figures according to the further comments of the referee.

References

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