

Dear Jan de Rydt,

Thank you again for handling the editing process of our manuscript and for your feedback.

We have now incorporated a more comprehensive discussion with respect to the choice of spatial resolution in the revised manuscript. We have undertaken a comparison between 16km and 8km pan-Antarctic constant present-day climate simulations, as suggested. The 4km pan-Antarctic run was not feasible for computational reasons. The results are presented in Supplementary Figure S13. Additionally, we have included results from 8km simulations in the MISMIP+ plot (Supplementary Figure S12) to offer further insights into the resolution-related aspects of our study.

The pan-Antarctic 8 – 16 km comparison shows that comparable mass changes occur in both runs in similar regions. The differences in mass change between both simulations lie well within the uncertainty bounds of our ensemble and may be attributed to the fact that both experiments represent a different bedrock topography (i.e., more detailed in the 8-km configuration).

We would like to underline that the goal of the MISMIP+ experiment serves a different purpose, i.e., it was carried out to demonstrate the validity/usefulness of the parameterisation for the flux across the grounding line, when grounding line migration fails at spatial resolutions that are too coarse. It is therefore not intended as a real convergence test. To address this concern, in addition to Figure S13, we are referencing Cornford et al. (2016) and Reese et al. (2018) more explicitly in our discussion. Especially, we emphasise the potential limitations of coarse resolution and the grounding line flux condition, as advised.

To enhance transparency, we have included an additional sentence in the discussion section, stating "We may therefore expect differences between our results and results at higher spatial resolutions, especially for small ice streams and outlets." This addition aims to underline our awareness of the limitations associated with the chosen resolution.

We hope that these modifications satisfactorily address your concerns about the justification for the 16km grid resolution for such a framework of producing ensembles of multi-centennial pan-Antarctic simulations.

Best regards,

Violaine Coulon, on behalf of all co-authors.