

Response to the editor and the reviewers

We would like to thank both the editor and the reviewers for their comments. We have revised our manuscript according to the reviewers' detailed comments (highlighted in blue) as outlined below. We also modified the acknowledgements. Proposed modifications of the manuscript are given in italics.

5 Detailed response

Reviewer 1, 1) The information on computational speed is incomplete. Does the speed on the Cray CS400 refer to using the entire cluster or a single node or single CPU? Rather than naming a specific manufacturer, a statement on the number of CPUs would be sufficient and more useful. The specific model of processor does not matter either, because the reader can assume that it is fairly recent.

- 10 We now specify the computational cost as follows: *In its Fortran version the actual dEBM code runs as sequential code on one core. After interpolation to the target grid, it takes about 5 seconds to compute the SMB of one year for a configuration with 360000 gridpoints on a CPU core (Xeon Broadwell CPU; E5-2697v4, 2.3 GHz).*

Reviewer 1, 2) reply to my original comment on p4, 115 and figure 2: Please consider adding this information to the manuscript.

- 15 We added the following to p. 10 ll. 8-12: *In Fig. 2 parameters reveal a temperature dependence which is predominantly associated with the elevation range of the PROMICE stations. The cloud thickness may be reduced at high elevations and τ_{cloudy} is therefore elevation dependent. For τ_{fair} (the empirical parameter in our downscaling) the elevation effect is small by comparison. The temperature dependence in emissivities $\epsilon_{\text{fair,cloudy}}$ is in part related to the larger water vapor content of warmer air and is implicitly accounted for, as we do not constrain ϵ_{fair} but only prescribe $\Delta\epsilon$.*

Reviewer 1, 3) my original comment on equation 13: The typo still is in the manuscript (Version 4).

- 20 We corrected this (this is unfortunately not highlighted in the tracked-changes file).

Editor: In addition to the points raised by the anonymous referee 1, I would like to suggest that the title of Sect. 6 “Conclusion” is not appropriate, because this section contains much information including many references. To me, some of them are not “conclusion” of this study. Therefore, I strongly recommend that you change the title of this section to something like “Summary and conclusions”.

- 25 We agree and changed the section name accordingly.