Below a reply to the review of Stephen Cornford. We would like to thank him for his review and remarks he had. Our reply is given in blue.

General comments by Stephen Cornford

What is missing, in my view, is a one-or-two paragraph discussion of the reasons that the models disagree (there are some points made, but not all in one place). ANICE and SICOPOLIS, for example, seem to retreat more than readily PSU, despite PSU having a grounding line treatment. Maybe this is to do with other parameters, e.g. the enhancement factors or the accumulation fields. Perhaps a future publication might address this by designing experiments with a more restricted set of parameters, e.g. all use the same accumulation scheme, but I would like to see at least some discussion here.

An additional paragraph is added in the conclusions, discussing the differences between the models.

"All six ... across the grounding line and sub-shelf melting. The PDD melt scheme seems less sensitive to initial conditions relative to the ITM scheme used by ANICE and leads to ice coverage over the WAIS land areas, also in the Pliocene$_{Ice-PRISM3}$ experiments for the other five ISMs.

The small spread in final ice volume of the AISM can be ascribed to the spin-up procedure employed prior to the 100 kyr steady state simulations. Changes of ANICE are largely mass balance driven, whereas a smaller ice volume corresponds to more melt underneath the ice shelves and a larger volume because of increased precipitation. The results of PISM and ANICE are comparable, whereas a similar procedure is employed for calculating the sliding using the SSA. Sub-shelf melting of PISM is relatively more sensitive compared to the other models (see Fig. S4). The largest re-advance of all ISMs is shown by the PSU-ISM, due to the grounding line parameterisation including in the ISM. For the Pliocene$_{Ice-PD}$ experiment, RIMBAY does not show a large retreat of the WAIS compared to the other ISMs, possibly related to the similar enhancement factors used for SIA and SSA flow. SICOPOLIS includes an additional grounding-line melt parameterisation. Although the Control experiments show a volume close to that of the initial ice sheet, the grounding line has retreated significantly. Moreover the melt scheme also induces a much further retreat for the Pliocene$_{PD-ANT}$ experiment with Bedmap1."

And one sentence is added at the end of the second last paragraph pointing at a possible future design of a model intercomparison:

"Moreover, it would be desirably that in a future study the design of the experiments is more restricted and that the ISMs use the same SMB and sub-shelf melting scheme, such that model intercomparison can focus on ice-sheet dynamics alone."

Specific Comments

AISM-VUB is said to have taken part in MISMIP3d. So it did, but it was one of the models (like PSU) that imposed a grounding line flux derived from Schoof 2007 (Table 2 of Pattyn 2013 has two VUB entries, both labelled A-HySSA) . But Table 3 says 'no special treatment', so either the Table 3 is incorrect, or Pattyn 2013 is incorrect, or this is not the model included in MISMIP3D.

Yes it has, but the model version here calculates SIA and SSA separately over sheet and shelf, respectively. We have removed the sentence referring to MISMIP3d to avoid confusion.

ANICE has 'Sub-shelf melting is calculated as described above, and only applied on floating ice'. Does this mean (a) only on grid cells whose center is floating or (b) on any grid cells that are partly floating. The difference is huge : (b) is an error that can dominate the results unless you apply extremely fine resolution.

This would then be option (a), this is now made clearer in the text.

Was the PISM sub-grid melt scheme (where melt-rates are imposed on the grounded nodes nearest the grounding line) used? Make a positive statement either way. Also, is the ratio of grounded to floating area not used to modify the basal traction coefficient (with modifications to the driving stress taking place through the one-sided difference)?

The sub-grid melt scheme was not used. Yes, the ratio of grounded to floating ice area is used. This has been reworded.