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Interactive comment on "Reducing uncertainties in projections of Antarctic ice mass loss" *by* G. Durand and F. Pattyn

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This paper discusses uncertainties in the simulated century-scale projection of the Antarctic ice sheet. A multi-model ensemble approach by the SeaRISE project, which has a large dispersion of the projection, is qualitatively evaluated. MISMIP experiment is proposed as a benchmark in order to filter the models whether or not have an ability to grounding line dynamics, which is expected to reduce an uncertainty in simulated projection. The approach of this paper is very unique and interesting. I think this paper is fairly well written and can be accepted with minor changes as follows.

One point which need more discussion is Figure 4. The authors show the uncertainty range of the models including capability of the grounding line dynamics (dark gray) is smaller than that not including (light gray). It is possible, however, that the dispersion

of the SeaRISE result is (partly) due to other differences among the participants. It is possible that an opposite impact is shown for the SeaRISE five models (not including grounding line dynamics) if they implement a method to represent grounding line dynamics. Actually I doubt it personally, but I suggest to include more clear explanation for the core message of this paper.

Another point is the SISM experiment configuration. An accumulation field is provided by the SeaRISE. Why not use this dataset for the SISM boundary conditions? Actual computation methods of the surface mass balance vary among the SeaRISE models, but at least all of them seem to based on this field. It is not necessary to reperform the experiment, but is to describe and discuss the influences of different boundary conditions. (Although I believe the difference of the surface mass balance has less impact on the conclusion of this paper).

Some minor points

P2626 L11. 'biais' → 'bias'.

Eq. (2) Computation of A depends also on other factors (e.g., age) than the temperature in some models. Also AIF spatially tunes this factor in a sense.

P2632 L10. 'a least' → 'at least'?

Sec 2.3. Not enough description for SISM. What value is used for the rate factor A? Is it spatially uniform? What combination of the coefficient and the exponent is used for Weertman type basal sliding? How do you determine the basal sliding grids, or basal sliding is imposed on all the domain?

Section 3.1. It may be better to split into the two: SeaRISE and the others (PIG).

Fig 1 or Tab.2. In this manuscript, Fig. 1 appears earlier than Tab.2 in the main text. So it is better to move the description of sea-level computation from the ice-sheet volume, to the caption of Fig.1.

Fig. 1. Is it possible to plot SISM results also in this figure?

Tab. 2. I prefer to see the SeaRISE mean/SD and the SISM results, not the mean/SD of SeaRISE and SISM.

Fig. 2. Unit of the time (year) is missing in the caption or the color bar.

P2639 L23. 'SSA models reacts...' better to add more explanation.

Fig 4. Dark/light grey are not explained in the caption.

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