

# Review: “Experimental protocol for sea level projections from ISMIP6 standalone ice sheet models”

by Nowicki et al.

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## 1 General

In this paper, the authors describe the framework for the ISMIP6 numerical experiments. This is clearly an important piece of work that documents a tremendous amount of effort, minutia, and thought. At the outset, it was not clear to me that a peer-reviewed scientific publication is the best venue for such a manuscript. However, given the readership of the *The Cryosphere*, I think that this is a fair choice and would support publication after a few minor revisions.

## 2 Remarks

1. From my perspective, the compilation of surface temperature anomalies and surface mass balance anomalies for several different models for both Greenland and Antarctica is very interesting. These are plots that I will likely refer back to and possibly use in talks. That said, I am confused about whether these results are published elsewhere and included here for succinctness or if this is their first presentation. If, indeed, this is their first presentation, I suggest highlighting this fact in the paper to a greater extent.
2. The number of acronyms in this paper is off the charts. I understand that this comes with the territory, yet it is still a hurdle to understanding the contents of this paper. I suggest (a) a table of acronyms in the appendix before the list of tier 2 simulations and (b) at every instance possible, avoid using an acronym or use both words and acronyms. I would understand if the authors find this request difficult to implement, my main request is that they think critically about whether or not every acronym is actually required and make an effort to reduce the total number.
3. Numerous ‘under review’ papers are cited. This makes sense because this paper and the cited papers are pieces of a larger puzzle, however, it would be ideal for the authors of this paper to explain the results of the cited papers to a greater degree, given that the referees have no access to the contents of those papers. In the future, this will also be beneficial as it will highlight the connections between each piece of the ISMIP6 puzzle.

## 3 Specific comments

1. page 11, line 23: here the ‘ISM’ is in the subscript whereas in other places, e.g. line 25, it is not. Which one is correct? I find the double subscript cumbersome but also think that the  $T_{ISM_{RCM}}$  notation is difficult to wrap my head around.

2. page 15, line 4: here and elsewhere, e.g. equation (7), I suggest removing the  $\times$  symbol.
3. page 17, line 15: what role does sliding due to subglacial hydrology play in these experiments? Here subglacial discharge primarily affects melting at the front, yet could also substantially affect sliding, which would be worth mentioning.
4. page 18, line 21: I find the presentation of this conditional statement a bit odd. It is possible that this is due to the weird spacing, but my main thought is that it is not clear what the intent of the presentation. Possibly a table or flowchart describing the different retreat scenarios would be better?
5. figure 9 and 10: these figures are extremely small and are a little difficult to read for that reason.
6. page 20, section 6: how does the ongoing discussion of the 'marine ice cliff instability' play into these choices?