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Geoscientific
Model Development
Discussions

Interactive comment on "Description of a hybrid ice sheet-shelf model, and application to Antarctica" *by* D. Pollard and R. M. DeConto

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This is a very good description paper of a mature ice sheet model that has been developed over the last ∼10 years. The different components of the model are described in reasonable detail, and selected applications demonstrate its applicability to the Antarctic ice sheet. In my opinion the paper can be published in the main journal (Geoscientific Model Development) essentially as it is.

I only have a few comments that the authors should address:

Page 1078, lines 13-17: For my feeling, the authors jump too fast to their main story. This is fine for readers already familiar with ice sheet modelling, but for other readers some more background information should be given. What is the purpose of ice sheet

modelling, how did the field develop since the first attempts in the 1970s, what are recent trends? I'm not expecting a lengthy review, but one or two paragraphs would be helpful to put things into perspective.

Page 1078, lines 18-20: The shallow ice and shallow shelf approximations deserve a reference.

Page 1079, line 19: Fractional area of what?

Page 1081, line 22: I suggest to replace the AGU abstract (Gillet-Chaulet et al., 2011) by the recently published paper by Seddik et al. (Journal of Glaciology 58 (209), 427-440, 2012).

Page 1088, lines 12-16: This "equation" is difficult to read. The layout should be improved.

Page 1122, Table 1: I'm surprised by the low values of the flow enhancement factor (1 / 0.3). This deserves a comment. In the inverse method that determines the basal sliding coefficient (page 1090, lines 12-13), how can basal sliding be distinguished from flow enhancement?

Page 1128, Fig. 5b: This figure is difficult to read. I can hardly see any variability of the calving rate.

Interactive comment on Geosci. Model Dev. Discuss., 5, 1077, 2012.