**The Cryosphere
Discussions**

Interactive comment on "Ice-shelf buttressing and the stability of marine ice sheets" *by* G. H. Gudmundsson

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I thank both reviewers for very professional and helpful reviews!

Below are my comments to points raised by the reviewers. I had hoped to have a new revised manuscript reflecting the changes that I've done in response to these points, but I have not had the time to finalized this new version. I hope however to be able to do so shortly.

Reviewer #1 : A.-S. Drouet

-Reviewer correctly points out that a better way of comparing my numerical results with fluxes based on Schoof's formula is to integrate along the whole grounding line. This is very good point and I will definitely do so in the final version.

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-Reviewer lists a number of minor technical mistakes. I thank the reviewer for spotting these and I will change the manuscript accordingly before final submission.

Reviewer #2: -The 'second' boundary condition along the sides is listed in the final version of GH12. The boundary conditions along the lateral margins are: 1) no movement in transverse direction (y direction), and 2) no xy shear.

-The reviewer correctly points out that unconfined ice shelves can have effect on grounded velocities, although the integrated horizontal stress balance along the grounding line is not affected. I'm very pleased that the reviewer pointed this out, and I will make sure to state this clearly in the revised manuscript.

-The reviewer also points out that in some higher order stress-balance formulations that vertical variation of stresses along the grounding line will be affected by unconfined ice shelves. I did mention this with respect to full Stokes models, and I will explain that this may also applies to other formulations of the stress balance that go beyond the SSA. -The reviewer suggest explaining some of the assumption behind Eq. (17) and I will do so as suggested.

-The reviewer stresses a very similar point made by A.-S. Drouet which is that to show the validity of Eg (17) one should integrate fluxes along the whole grounding line. As I explained above this is a very good point and I will certainly also show the agreement/disagreement between numerically calculated fluxes an those obtained by Eq (17) not only a one point (as done currently) but also the corresponding integrated fluxes.

Interactive comment on The Cryosphere Discuss., 6, 3937, 2012.