

Interactive comment on “The sensitivity of flowline models of tidewater glaciers to parameter uncertainty” by E. M. Enderlin et al.

E. M. Enderlin et al.

ellyn.enderlin@gmail.com

Received and published: 20 June 2013

The reverse surface slope in the model is a consequence of both high longitudinal pull and mass continuity within the basal over-deepening and is not an artifact of the longitudinal stress parameterization used in the model. Similar reverse surface slopes simulated for real tidewater glacier systems using a nearly identical 1D flowline model can be found in Nick et al. (2009, 2013). Further, reverse surface slopes can be observed at several tidewater glacier systems throughout Greenland (Howat et al., 2008; McFadden et al., 2011; Walsh et al., 2012). For example, elevation profiles obtained along the centerline of the northern-most Upernavik Ice Stream, West Greenland, contain a prominent ~2 km-long reverse slope feature within 10 km of the current terminus position.

C830

References

- Howat, I. M., I. Joughin, M. Fahnestock, B. E. Smith, and T. A. Scambos: Synchronous retreat and acceleration of southeast Greenland outlet glaciers 2000-06: ice dynamics and coupling to climate, *J. Glaciol.*, 54, 646-660, 2008.
- McFadden, E. M., I. M. Howat, I. Joughin, B. E. Smith, and Y. Ahn: Changes in the dynamics of marine terminating outlet glaciers in west Greenland (2000-2009), *J. Geophys. Res.*, 116, F02022, doi:10.1029/2010JF001757, 2011.
- Nick, F. M., A. Vieli, I. M. Howat, and I. Joughin: Large-scale changes in Greenland outlet glacier dynamics triggered at the terminus, *Nature Geosci.*, 2, 110-114, doi:10.1038/ngeo394, 2009.
- Nick, F. M., et al.: Future sea-level rise from Greenland's main outlet glaciers in a warming climate, *Nature*, 497, 235-238, doi:10.1038/nature12068, 2013.
- Walsh, K. M., I. M. Howat, Y. Ahn, and E. M. Enderlin: Changes in the marine-terminating glaciers of central east Greenland, 2000-2010, *The Cryosphere*, 6, 211-220, doi:10.5194/tc-6-211-2012, 2012.

Interactive comment on The Cryosphere Discuss., 7, 2567, 2013.

C831