Ocean Sci. Discuss., 10, C790–C791, 2014
www.ocean-sci-discuss.net/10/C790/2014/

Ocean Science
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Interactive comment on "Simulated melt rates for the Totten and Dalton ice shelves" *by* D. E. Gwyther et al.

Anonymous Referee #2

Received and published: 8 January 2014

This study offers an interesting and unprecedented numerical modelling perspective on ice shelf-ocean interactions in the Totten/Dalton ice shelves area. There is growing interest in this area of the world, and in this topic in general. This work will be of interest to numerous scientists including, but not limited to, oceanographers and glaciologists. I therefore think it should be published. I have however a number of issues with the present manuscript that I would like to see addressed, if possible. All the minor points, including notes about a missing figure (?), are marked in red in the attached pdf.

One major issue I have is about the general lack of description of the baroclinic circulation. Given that a major point of the authors relies on inflow of warm water onto the continental shelf, a process that is inherently baroclinic, this point is critical and a better description could easily be made.

Another important point is that I would like to see clearer explanation about the sea-ice component of the model (or lack there of), and the impact a better (more realistic) model might have on the result. Assuming that the flux-correction used do not correctly represent the amplitude of sea-ice production and its variability, my personal (naive) expectations would be that a more complex model could tapper down or enhance the links between the melting of the neighbouring ice shelves. Again this would not have to take a large part part of the revised manuscript.

Also important (but perhaps not as critical) is a need to go beyond hand waving arguments concerning heat budgets. Given that the authors are not strongly limited in terms of manuscript length, a quantification of each terms of the heat budget (detailing those due to air-sea fluxes, ice-sea fluxes, and, at least, advection) would be very beneficial in quantifying and strengthening the authors findings.

Please also note the supplement to this comment:
http://www.ocean-sci-discuss.net/10/C790/2014/osd-10-C790-2014-supplement.pdf

Interactive comment on Ocean Sci. Discuss., 10, 2109, 2013.