Clim. Past Discuss., 7, C1071–C1073, 2011
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Climate of the Past Discussions

Interactive comment on "Heinrich event 1: an example of dynamical ice-sheet reaction to oceanic changes" *by* J. Álvarez-Solas et al.

Anonymous Referee #2

Received and published: 14 July 2011

I thoroughly enjoyed reading the manuscript by Alvarez-Solas et al. It presents a beautiful new idea in an ice-sheet/ice-shelf modeling framework and provides an interesting twist on our understanding of the dynamics of Heinrich event 1. The paper is well written, but a few minor comments may help to further improve this significant contribution. It is in fact a pity that this paper was not submitted to a higher profile journal.

Minor comments: - the authors discuss a very important positive feedback for Heinrich events. Nowhere in the text is this mentioned. In fact, I think the authors would really gain fame with their results, if they added a little schematic figure, similar to the one attached here.

- I would recommend the authors to discuss figure 4 in more detail. Why is there a 2nd peak/plateau (around years 1200-2000)? What is the dynamics associated with this?

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Why does this occur only for one of the parameter configurations tested?

- Please be explicit about some issues regarding the physical consistency in the model set-up.

a. The existence of a Labrador ice-shelf excludes the possibility for Labrador Sea Water formation in reality. However, this effect is not taken into account in the Climber model simulation that is used as a forcing

b. I know that equations (1) and (2) are commonly used in offline-ice sheet model runs. But these equations assume that temperature and precipitation variations are homogeneous across the different ice-sheets, which I think is total nonsense. Stationary wave feedbacks are ignored and the ice-albedo effect is not captured in a physically correct way. I would urge the authors to just state the assumptions made when using this forcing upfront and discuss the caveats.

Interactive comment on Clim. Past Discuss., 7, 1567, 2011.

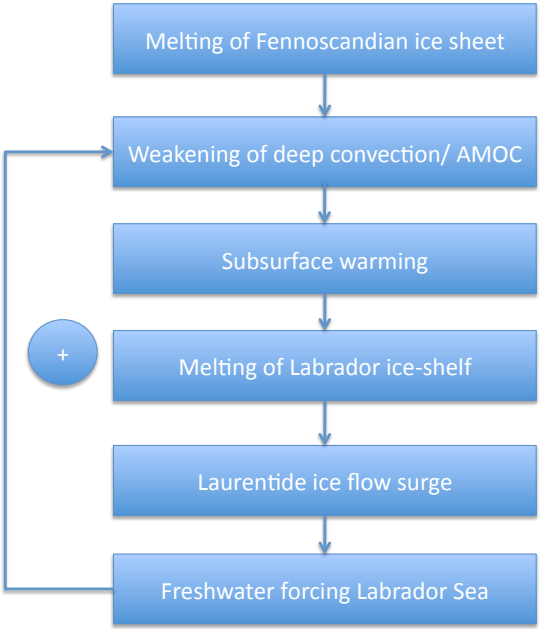

Fig. 1. Schematic figure suggestion

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