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Comment

Interactive comment on “Delaying future sea-level rise by storing water on Antarctica” by K. Frieler et al.

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Frieler et al. present an analysis of a scheme for delaying sea-level rise by pumping large amounts of seawater onto the Antarctic Ice Sheet, where it would freeze. The authors find that this scheme could produce a reduction in sea levels relative to a case in which nothing was done, that this benefit is only temporary in that much of the excess ice is advected to the ocean within a few hundred years, and that this scheme would be highly energy-intensive. The paper is generally well-written and discusses an interesting topic.

In my opinion, this paper should be published after minor revisions involving reorganization of the text, additional discussion of selected points, and proofreading.

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Reorganization: – I would suggest that the authors move the part of the introduction having to do with the energy costs of pumping water onto the ice sheet to the discussion. – Similarly, the last three paragraphs of the Results section seem to belong in the Discussion.

Additional discussion of selected points: – The authors spin up their model by equilibrating it to the modern climate. This spinup procedure is fully adequate given the scope of the study; however, I would like for the authors to comment on how this spinup procedure might affect their results. How does the spun-up ice sheet compare to the real one, in terms of total ice volume and spatially-distributed ice thicknesses and ice velocities? In the case of Greenland, I believe this type of spinup procedure generally results in an ice sheet that contains too much ice and where the ice velocities are generally smaller than on the real ice sheet. Does that result hold for Antarctica, too? – The authors use Comiso (1999) as their surface boundary condition data set. I think RACMO2 output is considered the gold standard for forcing ice sheet models; why do the authors prefer Comiso (1999) over RACMO2 results?

Proofreading: – The paper is missing many commas. The authors should review <https://owl.english.purdue.edu/owl/owlprint/607/> . – The manuscript needs to be read over carefully to catch missing words and other typographical errors.

Interactive comment on Earth Syst. Dynam. Discuss., 6, 1979, 2015.

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