The Cryosphere Discuss.,
https://doi.org/10.5194/tc-2017-37-RC2, 2017
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The Cryosphere Discussions

Interactive comment on "Ice-shelf damming in the glacial Arctic Ocean: dynamical regimes of a basin-covering kilometre thick ice shelf" *by* Johan Nilsson et al.

Anonymous Referee #2

Received and published: 8 June 2017

The paper presents a theoretical analysis of the feasibility and dynamics of an Arctic Ice Shelf during MIS6 and the LGM. The topic in itself is interesting, providing a new perspective on an element which is not fully understood in the reconstruction of past ice sheets in the Northern Hemisphere.

The paper is well presented, however, as Reviewer 1 states, the manuscript is highly technical. The discussion does serve to help a non-mathematician to understand the outcome of the work, but the model description and theoretical analysis in sections 3 & 4 are otherwise somewhat impenetrable to a non-mathematician. By its nature it is a theoretical analysis, so needs to be presented as it is, I wonder if it would be better

submitted to a more mathematical journal, but that it not to say that I do not consider it suitable for the Cryosphere.

I am afraid I cannot comment in depth about the mathematical theory, to my understanding it looks to be relying on all the appropriate sources, but I suggest that it needs a close look over by one of the many authors cited in the model description section to be sure that the conclusions that are drawn from the theoretical analysis are robust.

Corrections:

p1, line 5: should be "the ice shelf has . . ."

p1, line 8: should be "A narrow transition zone. . ."

p2, line 30: should be "These analyses. . ."

p2, line 30: should be ". . . Arctic ice shelf. . ."

p2, line 32: insert ". . . thick enough to ground and erode. . ."

p4, line 11: should be ". . . reaching more than 1000 m . . ."

p4, line 13: ". . .there are few" – should this be "few" or "a few" (very different meaning!)?

p5, line 3: should be ". . .simulated to lie in the range of. . ."

p13, line 13: should this be "amenable" rather than "amendable"?

p29, line 22: should be ". . .special setting . . ."

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