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Climate of the Past Discussions

Interactive comment on "Sea-ice dynamics strongly promote Snowball Earth initiation and destabilize tropical sea-ice margins" *by* A. Voigt and D. S. Abbot

Anonymous Referee #1

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This paper addresses an important and interesting issue, the role of sea ice dynamics in the initiation of a snowball earth event. The experiments are well done, figures clear and the analysis is useful. However, closely related papers discussing basically the same issue was published in recent years and the authors seem unaware of these:

Lewis, JP and Eby, M and Weaver, AJ and Johnston, ST and Jacob, RL, Global glaciation in the Neoproterozoic: Reconciling previous modelling results, GRL, 2004,

Lewis, J. P. and Weaver, A. J. and Eby, M., Snowball versus slushball Earth: Dynamic versus nondynamic sea ice?, JGR, 2007,

Lewis, JP and Weaver, AJ and Johnston, ST and Eby, M, Neoproterozoic "snowball

Earth": Dynamic sea ice over a quiescent ocean, PALEOCEANOGRAPHY, 2003,

I am sure that now that the authors are aware of these papers they would want to rewrite their own paper. This would require a major revision and my recommendation is to reconsider the manuscript for publication then.

Other comments:

1) In addition, the "Jormungand" state is mentioned here: can the authors discuss if such a seasonally changing sea ice state is likely to occur with sea glaciers (thick ice) rather than relatively thin sea ice?

2) Section titles: I wanted to suggest that sections 3, 4 and 5 are renamed so that the name reflects the objective of the run rather than the parameter values used in it. The first sentence of 4 and 5 may be a good place to start.

Interactive comment on Clim. Past Discuss., 8, 2445, 2012.