

Interactive comment on “The eigenvalue problem for ice-shelf vibrations: comparison of a full 3-D model with the thin plate approximation” by Y. V. Konovalov

E. Bueler (Referee)

elbueler@alaska.edu

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The attached review is quite detailed. I repost the summary here:

The abstract and introduction of this paper are promising, and I approached the content optimistically. Unfortunately there is very little reported here that is either surprising or useful. Replacement of the Holdsworth & Glynn (1978) thin-plate model by a 3D model would, in practical ice-shelf simulations, of course impose a large computational burden. Replacement would be worthwhile in some cases, however, if interesting results arose from the 3D model, but I am not convinced from what appears here. Analysis of the 3D results, relative to the thin-plate model, is attempted, but the presentation

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is technically narrow and conceptually impoverished. Most analytical statements provided here seem obvious, after applying some effort to understand what is said. Comparison of this paper to old literature—e.g. Holdsworth & Glynn (1978), Lingle et al (1981), Reeh et al (2003), all of which exploit simplified models and observations to understand real ice shelves—suggests how little insight is gained with this model and these experiments. As a developer of both 3-D and reduced-dimension models of ice sheets and shelves myself, I would want to see, in a 2015 paper, more demonstrated utility from such numerical models, and also better presentation of their theory and verification.

A completely re-thought paper with these properties:

- retitled [see review for suggestion]
- totally rewritten with attention to (limited) physical applicability and with attention to the needs of basic-knowledge readers [see review]
- 3-D rectangular box solution checked against analytical (exact) solution
- clear Figures [see review] including dependent of result on small parameter γ
- demonstration that 3-D solution matches thin-plate in $\gamma \rightarrow 0$ limit
- description of numerics so that reproduction of experiment is conceivable

might be publishable.

Please also note the supplement to this comment:

<http://www.earth-syst-dynam-discuss.net/6/C742/2015/esdd-6-C742-2015-supplement.pdf>