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Interactive comment on "Ice-shelf forced vibrations modelled with a full 3-D elastic model" *by* Y. V. Konovalov

Anonymous Referee #2

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The paper describes a numerical effort to solve for the elastic vibrational modes of a forced ice shelf. Specifically, the author calculates the elastic displacement amplitudes and mode shapes for a range of frequencies. While the numerical results themselves seem fine, it is not clear what the implications for this work are, and in many instances the descriptions of the results/model are poor and not very helpful. I also agree with comments of Referee #1, and that the contribution could be useful if the study can be better motivated, better described, and generally presented more carefully. Specific comments and questions are below.

The description of the model should be presented better. As is, the author presents a straightforward momentum balance (Eq 1) and boundary conditions (Eq 3), and a result of Holdsworth (Eq 2), but then jumps to an unintelligible mess of 9 lines in Eq 4, which

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is completely not helpful. If the equations are the same as in Konovalov 2014, none of this discussion of the model needs to be discussed, and it can simply be referenced. (In this case, none of Eq 1-4 or the related text are necessary.) If they are not the same, then the author needs a lengthier discussion of how Eq 4 comes about.

Since the main conclusion of the work seems to be that the results are qualitatively similar to those of Holdsworth, but quantitatively different, the results of Holdsworth should be quantitatively compared in the figures and there should be an explanation of the major differences. For example, I agree with Referee #1 that the spacing of the spectral peaks should be explained, as it should be relatable to the geometry/length, particularly since it is implied there is a perfect analog in the thin-plate Holdsworth case.

All results should be given in the "Results" section. As is, 2 figures are not discussed until the Summary, for no apparent reason.

As noted by Referee #1, the implications/impacts of the paper are not clear and must be clarified before the paper should be published. The abstract, results and summary all need to be clearer about how this work adds to the existing body of knowledge, particularly what importance it has beyond the work of Holdsworth. For example, do any of the differences in predictions (e.g., increasing shear stress?) result in different physical implications than what would be concluded from the Holdsworth work?

Finally, as also pointed out by Referee #1, the English is quite poor in many places, making it especially difficult to read. Many of the issues are actually presentation issues not directly related to grammar, but fixing the grammar would certainly help improve the paper.

Interactive comment on The Cryosphere Discuss., 8, 6059, 2014.