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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 #1

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The paper presents a 3D elastic study of the mechanical impact of ocean waves in a sub-ice shelf cavity on the overlying ice shelf. The focus is on short time-scale over which the ice can be approximated as elastic. One of the novel feature of the study is that the ocean flow in the cavity is modelled by the wave equation.

The citations are incomplete and sometimes appear rather random. Why all these citation on page 6065 page 4 to glaciological work when referring to the sigma coordinates? This is a standard numerical method, and not invented by glaciologists. There is no need for a citation here, and if, then to some standard textbook in numeric. And why are the citations to applications of beam theory to completely different type of a problem (line 14, page 6061)? It seems more logical to refer to work done on the impact on tides on ice shelves. There is no reference to any measurements and no

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attempt to try to verify the model against observations.

I was hoping the paper would answer if high freq. wave induced by the ocean have the potential to set up stresses large enough to cause fracture. The possibility of this is mentioned in the abstract, but this is then not revisited in the conclusions.

The English is poor and will have to be corrected by a professional copy editor. TC does offer this service, but at a cost. Anyhow, as it stands now someone must go through the manuscript and improve the English.

It is unclear why one needs to use the full set of the momentum equations in this situation. The deflections are clearly small compared to ice thickness and the wavelengths are long. So it would be very puzzling if beam theory could not be used.

Abstract: Usually better to write in the present tense. So write 'Ice-shelf forced vibration modelling is performed. . .' on so on.

I found it difficult to understand the spacing of the spectrum peaks (Fig. 2 and 6). Are these somehow related to the cavity geometry? Or are the independent of the cavity geometry and only function of ice thickness and the elastic parameters?

The paper is definitely a valuable contribution to science and should be published. It would benefit from a better introduction explain the motivation for the study and why it is important. The citations list should be redone carefully, including all relevant work and excluding all these references to work that bears no relation to the study subject.

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