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Interactive comment on "On the tides and resonances of Hudson Bay and Hudson Strait" *by* D. J. Webb

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I would like to thank the reviewer for his comments.

1. Complex angular velocity is used a lot in the study of periodic systems. You might be able to find a modern physics text book which covers the subject - otherwise "The Feynman Lectures in Physics", Volume 1, Chapter 23, covers the basics. A Google search for "resonance complex plane" will generate many more references.

2. The effect of sea ice certainly needs to be thought about. Floating sea ice with lots of gaps between the floes should have no effect on the solution because dynamically it will act just like the same mass of liquid water.

As the floes come into contact with each other - or with a coastline, there will be areas

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of ice which will not be moving at the same speed as the water underneath. In this case the primary effect will be to create drag and so dampen the tidal wave. A similar effect is seen with normal open ocean surface waves and swell. These die off fairly quickly near the edge of an ice field.

So if the model solutions for Foxe Basin and Repulse Bay had been too large as well as having poor phases, then sea ice could have been responsible. However if the depths are wrong, this will affect the phases and have less effect on the overall amplitude. The model amplitudes in Foxe Basin and Repulse Bay are not unreasonable so I conclude that of the above two possibilities, errors in the depths are the most likely.

3. In Appendix II of the paper, I refer to an investigation of the properties of the adjoint system and say that the results will be published in a technical report. This report is now published as:

Webb, D.J. 2014: On the adjoint of Laplace's tidal equations. Southampton, National Oceanography Centre, 27pp. (National Oceanography Centre Internal Document, 07).

and can be downloaded from:

http://nora.nerc.ac.uk/504473/ or http://eprints.soton.ac.uk/361041/

I warn readers that it is a bit dry and for that reason is published as an Internal Document.

Interactive comment on Ocean Sci. Discuss., 10, 2053, 2013.