

**Comments on revised manuscript (version4) “Grounding zone subglacial properties from calibrated active source seismic methods” by H. Horgan et al**

**Alex Brisbane, January 2021**

The authors have made significant changes to the original manuscript. This has improved the clarity and completeness of the paper. The authors have in general addressed the points raised in my original review with one omission as detailed below. The removal of the clustering (in response to Reviewer #1) has, to my mind, improved the manuscript by removing unnecessary distractions from the key messages. There are some important results pertaining to reliable data analysis for basal properties.

There is still an issue with regards the free surface effect, as discussed on Page 3 of Reviewer 2 response. Shearer (2009) Eq 6.19 accounts for the amplification effect due to conservation of energy that results from the density contrast between the source and receiver depths. However, this amplification is in addition to the free surface effect which is a doubling of amplitude at the free surface due to the conservation of energy (which I would argue is still pertinent with a receiver burial depth of 0.5 m). It just so happens that all these methods rely on amplitude ratios to derive  $A_0$  and the free surface effect therefore drops out. However, for completeness it should be included, or words to this effect included, as per H&A2009.

**Additional minor comments**

**P8L23** (H&A2009, Eq. 9)

**P9L18** should this be  $A_0$  rather than  $R(\theta)$

**P17 Figure 8** – for clarity plot the red tidal signal on top of the blue bars

**P18 L3** – reproduce not reproduced