Dear Dr. Marchenko

We greatly appreciate that you have taken the time to thoroughly read our manuscript and provide insightful and constructive suggestions. We have followed each of your recommendations which has helped improve and clarify the results and discussion around them.

Best regards,
Dyre Dammann

General comments to the paper are as follows.

The paper consists of theoretical part focused on the description of the methods of the data processing and experimental part describing organizing of the field works and obtained results. Performed measurements are new and interesting, but the theory doesn't explain observed features of wave motion. Discussion in the end of the paper is not specific enough. I recommend improving this gap.

We have now incorporated more discussion around superposition which now provides a more clear link between the modeled examples and previously incorporated results as well as newly included observations.

Authors discuss that superposition of waves including waves reflected from the iceberg and waves reflected from the lead may influence the GPRI records. In this case wave motion in the region is not reduced to one harmonic wave. Therefore, methods described in Section 2.3 should be adjusted to the situation of wave superposition. Some simple demonstrations of possible effects would be useful to understand if wave superposition may explain the observations.

This is a good suggestion and something that we now have included by incorporating superposition in the methods section in terms of an equation (Eq 7) and modeling examples (Figure 3), which do support the observations later on. We have provided a better explanation for the reflected edge wave as now discussed as a case of superposition supported by a simple model result. We have also incorporated a possible example of a standing wave to demonstrate another case of wave superposition (Figure 10) also modeled in Figure 3.

Incoming long waves may influence iceberg tilts and tilts of the GPRI. It leads to changes of the angle theta in equation (1.2). Analysis of this effect could be useful for the interpretation of the GPRI records.

We have now included a statement in Section 4.2 discussing uncertainties related to the angle theta. The largest uncertainties will be related to the antenna elevation and we think the simulations carried out in the Appendix are helpful in demonstrating potential effects in the case the iceberg were to move. We thus now write: "The derived amplitude is dependent upon the incidence angle, θ, which is subject to uncertainties, predominately driven by inexact estimation of the antenna height atop of the iceberg. Uncertainties from sensor tilt due to iceberg motion are

not considered as significant changes in θ could be identified in the antenna leveler and interferometric phase as illustrated in the Appendix."

Most strange result is that in E2 the GPRI records didn't show the wave propagating onshore which was registered with the IWRs. It is possible that incident onshore wave excites natural oscillations of ice in the lead propagating along the lead. But the incident wave should have an input in ice motions in the lead. Theoretical explanation of this result would benefit the paper.

This is a great point. We naturally have to concider the incoming wave field as well. In response to your previous comment, we included a description of superposition and now aregue that E2 represents such a case of superposition of edge waves with the incoming wave field. Overall, this does not change the results much, but leads to a more reasonable explanation and also a predicted edge wave orientation directly parallel to the lead direction, which gives reason for strengthened confidence in this overall explanation.

Detailed comments.

Line 170. Reference on Table 2 is given in the text, but Table 2 is not presented in the text.

Good catch. The reference has been taken out

Line 170. C_0=-10 m/s. If it is speed, then it should be positive. The onshore direction is mentioned in the text.

Changed.

IWR35 is listed in Table 1, but the information about records of IWR35 is not given in the text.

Now included: "IWR#35 is situated behind grounded ice, in shallower water with thicker ice and does not exhibit the same signal as the other IWRs."

Line 195. C_0=-27. m/s ?. What means sign - ? The speed is positive/

Good point. Sign has been removed

The paper fits the journal profile and worth the publication after the revision. According to the comments above I recommend major revision.