

Interactive comment on “Sea ice draft in the Weddell Sea, measured by upward looking sonars” by A. Behrendt et al.

Anonymous Referee #1

Received and published: 14 September 2012

General comments

This paper does an excellent job of introducing the extensive ULS datasets, explaining the physical response of the sonar systems to a variety of surface conditions, and quantifying the errors associated with various aspects of the system. It is comprehensive, and reads well for the most part (see specific comments and technical corrections below). I feel that this document is sufficient for a thorough understanding of the ULS data, and should be a very useful reference for those who use the data.

Specific comments

806, l23: Not just Atlantic – other basins too?

807, l1: provide references

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l8: provide reference for Arctic submarine observations

l12: not necessarily true: ship-based drilling operations may be biased toward thicker floes as these are often safer for fieldwork.

Section 1: This section also needs to mention the capabilities of CryoSat-2 – this may contradict the point raised on 807,l13-14.

809, l10: Why was the prime meridian chosen?

810, l3: Which ECMWF reanalysis product? A comment on accuracy would be appreciated here.

l4-5: Could you quantify the relative error magnitude of the atmospheric pressure and the speed of sound error?

815, l15: "Only those instruments with a rate of four minutes or higher were found to be suitable for the procedure" needs to be changed to either "four samples per minute" or change "rate" to "period", depending on which is true.

818, l4: This inflection point depth is the same as the physical mixed layer depth, right? If so, could you please say so.

l18: If the surface and ULS temperatures are both -1.8 C, then shouldn't you replace "linear" with "constant"?

819, l2: Why did you use harmonic means?

825, l8-10: These biases are non-negligible, so the fact that corrections haven't yet been applied in your dataset needs to be emphasised somehow.

l25: Don't use the term "significant" unless you mean "statistically significant". If you do mean this, please provide justification.

825, l13: The selection of results for the "selected results" section is a little puzzling. How were these results selected? Are these regions representative of others?

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826, l3: The conclusions make no mention of the selected scientific findings (generally thickening) from the previous section. This section might also be a good place to emphasise the bias corrections haven't been applied.

Technical corrections

806, l15: The data can be downloaded under <http://doi.pangaea.de/10.1594/PANGAEA.785565>.: change "under" to "from"

807, l3: avoid single sentence paragraphs

l23: add "primarily" to qualify reflection surface.

809, l25: earlier, you refer to software version <1 and >1, but here you refer to exactly 1. Please clarify.

810, l7: Watch the tense of this sentence.

l23: "Step 2" doesn't "check...." or "calculate.....", rather there are calculated and checked in step 2.

813, l5: This sentence is very confusing. Please clarify which method is used for these instruments.

814, l6: Typos in this sentence

818, l13: Does this figure of 3.8 m/s refer to the mean speed of sound between the surface and the ULS?

823, l3: please add "statistical" before "mode"

Figures:

Fig 1: h, d, z, etc... are italicised in caption, but not in figure.

Fig 2:

Much of the text is illegible.

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Please annotate Weddell Gyre

Many locations referred to in the text should be annotated here, e.g., Joinville Island, Ant. Peninsula.

Fig 8a: Please specify in the caption whether this is a harmonic mean or not.

Fig 12: More detail is needed in the caption, e.g., top panel:....., bottom panel:.....

Fig 13: Since we are comparing draft in different years, it would be beneficial for the month span (on the x-axis) of each comparison to be the same.

Fig 14: Shouldn't this say "same as in Fig 13?", not Fig 7?

Tables:

Table 2: Does this information really need to go in a table?

Interactive comment on Earth Syst. Sci. Data Discuss., 5, 805, 2012.

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