The Cryosphere Discussions

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Comment on tc-2021-61

Anonymous Referee #2

Referee comment on "Winter growth and tidal variability of the sub-ice platelet layer observed with electromagnetic induction soundings" by Gemma M. Brett et al., The Cryosphere Discuss., https://doi.org/10.5194/tc-2021-61-RC2, 2021

This paper reports observations of the evolution of the sub-ice platelet layer beneath fast ice in McMurdo Sound through late winter and spring of 2018. Overall, I found it a difficult paper to review. I found no issues in the analyses or the results, but, even after several readings, I was still a little unclear about what the authors key findings are. I think the reason for this is that the paper is presented more in the form of a data report than a study addressing specific questions. Unfortunately, that means that the manuscript appears to be of limited interest to anyone who is not working on the sub-ice platelet layer in McMurdo Sound. The authors presumably had the aim of answering some broader science questions when they went to the not inconsiderable effort of collecting the data. However, those broader questions and how the results help to answer them are never clearly shared with the reader.

Once I had rationalised my general misgivings about the paper, there were a couple of places where, with hindsight, the problems are clearly apparent. The first is the title "Winter growth and tidal variability …", two arguably unrelated aspects of the sub-ice platelet layer are treated in the same paper. Now, both are related to the processes of formation of the layer and the temporal variability of those processes. Only the timescales differ. However, the processes are barely touched on in the paper, and are never used to link the two sets of observations. For this reason, it took me some time to figure out what actually had been measured at the various sites, and even now I'm not sure that I have it all clear in my mind. The only motivation for putting all these observations together in the same paper would appear to be that the data were collected as part of the same campaign. But that link has little relevance to those not involved in the fieldwork and whose main interest in these measurements is the insight they can give into sub-ice platelet layer development.

The lack of a focus on processes becomes apparent in a statement towards the end of the paper. Following a quite long, but inconclusive, discussion of what might have caused the tidal variability, there is the statement (lines 550-551) that coincident oceanographic data were collected that will contribute to understanding the tidal variability in the sub-ice

platelet layer. If the motivation were to advance our understanding of the processes driving tidal variability, wouldn't it make more sense to publish all the data that can contribute to that understanding together in a single paper? It would definitely be of more use to the wider community. Once again, that points to the primary motivation for this submission being the publication of a dataset rather than the solution of a scientific problem.

For this reason, I would not recommend that the paper by published in the Cryosphere in its current form. I should be clear that my recommendation does not in any way reflect on the quality of the data themselves, or the data collection and processing. The authors have clearly completed a challenging field campaign to high standards and have collected a great dataset that could potentially be valuable to others. However, the paper as currently written does not really do the data justice and does not communicate their value to the reader, nor how they can be used to advance understanding of sub-ice platelet layer formation.

I would actually recommend that the authors split the data over two papers, one focussing on "winter growth" and the other on "tidal variability". Each one needs clear statements of the problem being addressed and how the data contribute towards new understanding of that problem. The latter paper should ideally wait until the oceanographic data are available, so that a more complete and rigorous discussion of the processes driving variability can be given.