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The Cryosphere Discussions

Interactive comment on "An Antarctic monitoring initiative for fast ice and comparison with the Arctic" *by* P. Heil et al.

Anonymous Referee #2

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General evaluation

The manuscript presents (a) the existing fast ice monitoring network in the Antarctic, (b) plans for further improvement of the observations, (c) very few new results, and (d) qualitative comparisons between fast ice in the Antarctic and Arctic. The authors made me convinced on two issues: (1) the importance of making observations of fast ice in the both Polar regions, and (2) the usefulness of the existing data from the East Antarctic and Ross Sea region. The manuscript reads, however, much more like a research plan instead of a journal paper. The text is meandering around various aspects of the importance of fast ice, previously published results, challenges in the observations, and planned improvements in the observational system, but important new scientific results are few and solid conclusions are basically lacking. Hence, although I warmly welcome

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Interactive Discussion
Discussion Paper

further research activities in this field, I cannot consider the present manuscript meeting the standards of a scientific paper to be published in a peer-reviewed journal. I regret that I have to suggest the manuscript to be rejected.

Detailed comments:

Introduction is basically well written, although I did not become convinced that there are strong relationship between the variations in the total Antarctic sea ice extent and the fast ice extent. Fast ice represents so small fraction of the total sea ice cover and, except in summer, much of the variability in the latter takes place much further north.

Section 2 on data and methods is vague, lacking concreteness.

Section 3 on AFIN observatories indeed convinces me on the great activity and a valuable data set, but it is a disappointment that the manuscript does not get much out of the data. The first sentence on page 2442 is unclear.

Sections 3.2 and 4 are interesting but mostly repeat previously published results.

The text in Sections 3.5, 6.1, and 6.2 would better fit to a research proposal.

Section 5: On the basis of the material presented, I am not convinced on the increase in synoptic-scale cyclone activity in the Southern Ocean. A study based on a reanalysis may yield such results, but we have to remember that the data available for reanalyses has changed a lot during years. In particular, much more satellite data are nowadays assimilated into models, helping cyclone detection. The authors do not specify the period of the increase, but a reference is made for a study published in 2000. What has taken place after that?

Section 5.1 presents one of the few new results of the manuscript: shift of the date of the annual maximum ice thickness, but its statistical significance remains unclear. The Abstract refers to an increase in the inter-annual variability, but this result is not well presented in the text sections.

TCD

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Section 5.2 seems not to include any new results and in Section 5.3 only Figure 4 seems to be new. The scientific importance of Figure 4 is, however, not convincing.

Instead of presenting analyses on the links between large-scale atmospheric circulation and Antarctic fast ice, the authors speculate about the importance of the data in the first page of Section 6.

Section 6.3 presents some inter-comparisons of the Arctic and Antarctic sea ice, which is a fascinating topic. Unfortunately the results presented are either trivial (lines 2-5 on page 2453) or references to previous publications, or questionable (lines 21-25; although snow ice formation is rare, superimposed ice is common in the Arctic, where a lot of snow melts on sea ice in summer). Lines 12-14 may include something new, but the results a presented too qualitatively.

There is not much written in Conclusions and, referring to my comments above, I am not convinced on the increased/increasing inter-annual variability.

Figure 2 would be much clearer, if plotted in (t,z)-axes with temperatures given as color codes.

In Figure 3 the authors refer to a rapid thickening associated with platelet ice, but according to the drill-hole measurements there is not any particularly rapid thickening at the time indicated by the black dotted line.

Interactive comment on The Cryosphere Discuss., 5, 2437, 2011.