The Cryosphere Discuss., 8, C851–C854, 2014
www.the-cryosphere-discuss.net/8/C851/2014/

The Cryosphere
Discussions
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Interactive comment on "A sea ice concentration estimation algorithm utilizing radiometer and SAR data" *by* J. Karvonen

Anonymous Referee #2

Received and published: 31 May 2014

Kavonen (2014) present an improved SAR sea ice concentration algorithm that utilizes radiometer data for improved segmentation. The paper covers scientific questions that are relevant for TC. There are a few revisions needed before publication.

p. 2216 line 13. Why is only the HH channel utilized? This is unclear specially since it is also outlined that the AMSR-2 channels have both H and V polarizations.

p. 2216 lines 15-20. Did the same kind of temperature and wind conditions prevail during the two time periods?

p. 2220 line 14. How many hidden-layer neurons were normally used? What is rather fast?

p. 2221 line 10. How comparable are the sea ice conditions in the Baltic Sea and the

Barents and Kara Sea? A description of the study areas "normal" sea ice conditions could perhaps be included in chapter 2?

p. 2221 line 10. What is a good agreement?

p. 2222 line 9-18. How do the error and standard deviation estimates presented here compare to previous studies of sea ice concentration? It would be nice to see an expanded discussion on the results from the comparison with the FMI ice charts for the two algorithms (yours and ASI).

p. 2222 lines 18-21. If possible include a line in the figures indicating where the sea ice edge is so that it is easy for the reader to identify the areas affected by wave conditions.

p. 2223 line 7-8. Here it is stated that the ASI overestimate the sea ice concentration in the coastal zone. How does this compare to the presented new algorithm results?

p. 2223 line 11-13. Which Arctic areas? Is it possible to provide an indication in the Figure as to the affected areas? Is this overestimation done by the presented new algorithm or by the ASI concentration estimates?

p. 2223 line 15. Why wasn't a training data set compiled for the Arctic study area as well?

p. 2223 line 16. Why were only a visual evaluation made? What does "quite well" imply?

p. 2223 line 23-25. The author indicates that the difference in resolution would affect error estimates. Why wasn't the lower resolution used for such calculations in order to compare the results?

p. 2223 line 27-29 - p. 2224 line 1. In your opinion what would be the best way to improve the performance, more training data or use the same amount of training data from the Arctic?

p. 2224 line 6. How large were the standard deviations?

p. 2224 line 11. How does the thickness estimates contribute to the sea ice concentration estimates? This is not clear at present.

p. 2225 line 11-15. Would it have been possible to use another data source for the comparison than the FMI sea ice charts as they are based on SAR data?

p. 2226 line 11-12. Which areas?

The evaluation would benefit from an indication if certain ranges in sea ice concentration are easier to identify with the different sea ice concentration algorithms. E.g. is the presented new algorithm better in distinguishing high concentration sea ice than low concentration sea ice? Or similar?

Figures. The figures are generally quite small and it is difficult to see all the details described in the text. Maybe some kind of indication in the figures as to what the author is talking about could be included, maybe a reference to a position in Lat/Long or similar.

Generally some subjective words such as; little, worse and some could be changed into more precise indications.

Minor revision; p. 2219 line 4-5. "The boundaries of different..." This is not clear.

p. 2219 line 9. The abbreviation MLP is explained already on page 2216 line 5.

p. 2219 line 11. What is the resolution of the FMI gridded ice charts?

p. 2221 line 6. What is the resolution of the AMSR-2 bootstrap algorithm?

p. 2221 line 6. Bootsrap needs to be changed to bootstrap.

p. 2221 line 12. Figure 5 is referred to before Figure 3 and 4.

p. 2221 line 12. Should the reference to Figure 5 be changed into Figure 7?

p. 2222 line 18. Figure 5 is again reference before Figure 4. Order of Figures needs to be changed.

p. 2222 line 23. "In these figures..." Which figures, figure 3 and 5?

p. 2222 line 28. Does "...the bootstrap algorithm result in both cases." Refer to the Gulf or Riga and the Gulf of Finland?

p. 2222 last sentence - p. 2223 first sentence. This is not clear.

p. 2224 line 16-18. "...the MLP convergence was slower and estimation results worse..." How much slower and how much worse?

p. 2225 line 19. How much is a "little multi-year"?

Tables. The tables would benefit from a more comprehensive table captions. E.g. indication to test areas, datum for the different data sets, and an indication if the results are presented for the algorithm results compared to the FMI ice charts etc.

Figure 1 and 3-8. Inclusion of the coordinates would be beneficial, e.g. lat long or similar on the axis.

Figure 7. Which areas are not covered by the SAR mosaic?

Figure 8. Here the proposed algorithm is referred to as the FMI algorithm. This is the only instance where that happens.

Interactive comment on The Cryosphere Discuss., 8, 2213, 2014.