

Interactive comment on “Assessment of error in satellite derived lead fraction in Arctic” by N. Ivanova et al.

Anonymous Referee #1

Received and published: 11 December 2015

The manuscript “Assessment of error in satellite derived lead fraction in Arctic” presents the validation of an existing algorithm for sea ice lead fraction (LF) retrieval. While the considered algorithm uses passive microwave satellite data, this study also presents an algorithm using SAR data - which is here used as reference for the lower-resolution passive microwave data. Finally, their work also suggest a refinement of the empirical parameters in the passive microwave LF retrieval algorithm.

The manuscript presents a valuable contribution to sea ice remote sensing techniques, the chosen analysis methods are sound, and the authors discuss the most important limitations and open questions of their study. I can therefore recommend it's publication in TC after some minor issues are resolved.

Minor Issues:

C2470

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Both AMSR-E and SAR LF algorithms heavily rely on empirical tie-point or threshold values. How do you justify that one can be used as ground truth for validating the other? Also, the data presented in Figure 4a raises the question if the SAR and AMSR-E LF algorithms measure the same quantity at all, or if both algorithms retrieve different sea ice properties.

The second half of the manuscript lacks good structure. For example, the adjustment of the ASMR-E LF retrieval is somehow hidden in the discussion part. I would recommend to dedicate an own sub-section to the determination of the new tie-points, and give recommendations on how the algorithm should be used in the future. This is an important result that must be easy to find for someone that skims through the paper.

page 6319 line 21: what do you mean by the phrase in parenthesis? Please reformulate this sentence and be clear what criteria the desired data set should meet, or which criteria is doesn't need to meet if that is important here.

Equation 1: What is the scale of the median filter?

Is there a possibility that the SAR LF algorithm could oversee any leads?

page 6330 line 8: Can you give a reference or other evidence for the power law behaviour?

Technical corrections:

page 6317 line 14: instead of correlations, I think you mean a causal relation, or dependence.

A couple of articles (“The”) are missing in the text.

Change the title to “Error assessment of satellite derived lead fraction in the Arctic”

Equation 1: If there is no vector cross product involved, use a simple dot instead of the cross.

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page6324, line 17: Remove “While”. It is not possible to form a sentence from to dependent clauses with no main sentence.

page 6330 line: “define” is not suitable here. I would argue that you have determined the value for r100.

Interactive comment on The Cryosphere Discuss., 9, 6315, 2015.

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