

*Title: Satellite Passive Microwave Sea-Ice Concentration Data Set  
Inter-comparison using Landsat data*

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*General Comments*

*The authors compare sea ice concentration from 10 global passive microwave products with that estimated from visible/near-infrared Landsat images. This highly detailed analysis is an important piece of work: the passive microwave record constitutes the longest existing record of global sea ice cover and it is crucial that users of these data understand when and where we have good confidence in particular products. One particularly useful aspect of this work is the comparison with the range of different ice regimes and an assessment of confidence in this comparison. This work highlights the need to assess satellite products under a range of different ice conditions and to consider concomitant processes that influence the sea ice concentration.*

*The authors provide good context by highlighting some of the limitations of the previous work on which this study builds and highlighting the reasons why a comparison of products such as this one is needed. They also provide the background and support needed to justify the datasets they are using to make the comparison.*

*This is a robust piece of work. The authors have given thorough consideration to any bias their method introduces to the estimation of sea ice concentration in the Landsat images and have made a rigorous comparison for different ice types. The case studies provide ...*

*One thing I am not sure about is the accessibility to a wide readership. It is (necessarily) a dense read packed with technical details but as a reader, it is quite hard to keep track of all this detail. However, this is an important and well-conducted contribution to the literature and I recommend this manuscript for publication. I have noted some minor points below.*

*Thank you for your honest and positive opinion about the manuscript. We are aware that it is (again) quite long as the two previous publications of the same kind. This is an opinion also shared by the second reviewer. To our opinion, however, it is the degree of detail which makes this publication of interest to those readers that are into the topic, because they might find the missing piece of information they have been looking for without success in other papers about a similar topic. In order to enhance the readability for readers with a general interest only, we tried to be as succinct as possible in abstract and summary.*

*Line 45-46: I am not sure what you mean by "convergent high-concentration ice situations".*

Changed to "... pairs revealing convergent ice motion and therefore a high probability to encounter high, near-100% SIC."

*Fig 11: it is quite hard to read the text and there is no accompanying table. Perhaps you could move the legend into the white space below the Landsat 5 figure and increase the size of the text?*

As Fig. 11 has a second part without space below the Landsat 5 figure, we reshuffled the legends such that we could also increase the font size.

*Line 43: suggest changing "are" to "a"*

Thank you, we corrected this typo.

*Line 44: you might consider changing the first instance of "used" to "assessed".*

We don't think "assessed" fits here and instead replaced "used" by "utilized".

*Line 85: you could just quote the number here to aid the reader, e.g. "an order of magnitude smaller than the 300 scenes used in this study".*

Thank you. This is a good idea, which we realized as suggested.

*Line 101: suggest changing "satisfying" to "satisfactory".*

Changed as suggested.

*Line 107: suggest adding "that are" in between "polygons" and "highly".*

Changed as suggested.

*Line 121-123: there is something not quite right with the grammar here.*

We changed this sentence into: "The same applies to the fact that four of the products (SICCI-12km, SICCI-25km, SICCI-50km, and OSI-450) allow us to take into account the full SIC distribution at 0 % and 100 %. Such a distribution is the natural result of the SIC retrieval method used in all SIC products considered - except NT2-AMSR."

*Line 127: suggest changing "of" to "from".*

Changed as suggested.

*Line 130: suggest changing the second instance of "of" to "from".*

Changed as suggested.

*Line 153-154: suggest changing both instances of "is" to "are".*

Thank you, we corrected these typos.

*Line 296: suggest changing "quantifying" to "to quantify".*

Changed as suggested.

*Line 308: do you mean "cases" instead of "cased"?*

Certainly we do. Typo is corrected.

*Line 599: suggest "also is" instead of "is also".*

Changed as suggested.

*Line 642: suggest deleting ", which is".*

Deleted as suggested.