

## ***Interactive comment on “Satellite Passive Microwave Sea-Ice Concentration Data Set Intercomparison for Arctic Summer Conditions” by Stefan Kern et al.***

### **Anonymous Referee #1**

Received and published: 25 March 2020

Dear authors of the manuscript tc-2020-35,

The manuscript is interesting and useful for the sea ice research. It is very useful to make this kind of comparisons. Comparisons to MODIS SIC give an idea of the weaknesses of the existing algorithms and also gives tools to correct or improve the current algorithms, especially in the summer conditions with the highest uncertainties. The suggested bias correction looks like a promising approach to get more accurate SIC or ISF estimates. Also the potential explanations for the algorithm behaviour in summer conditions are interesting and useful information and give good information for further research and algorithm development.

C1

I only have a few minor comments:

- 1) The algorithms have been divided into four groups. I think the division has been in more detail reasoned in the previous TC paper of the authors. However, I would miss a short description/reasoning also here pointing out what are the actual differences between the algorithm groups and what are the similarities (and differences) within groups. I think this can be seen as a clustering analysis i.e. looking for an optimal set of clusters simultaneously minimizing within-cluster distance and maximizing between-cluster difference for a set of (selected) features.
- 2) There are formulas of the parameters discussed given. Even though they are mostly quite simple, formulas would make the presentation even more clear, e.g.  $SIA = \int SIC \, dA$  or something similar, now they have (only) been described in words.
- 3) Some abbreviations are not explained, at least PR and GR should be explained as they appear for the first time (even though they are clear for the most readers). Still check all of these. Possibly even (general) formulas for PR and GR could be given? Also open OSI SAF and SICCI.
- 4) Consider of replacing "<" and ">" in the text by "less than" and "greater/more than"
- 5) P2 L59: "...early in the melt season or on land-fast sea ice..." When this may occur over land-fast ice? Also during early melt season?
- 6) P3 L125: "... with the size of the field-of-view of..." Could this be e.g. diameter (I think the unit of the size should be km<sup>2</sup>)?
- 7) P7 L1149-150: "last accessed October 12, 2016". This is almost 4 years ago, update this.
- 8) P5 L187-189: "...excluded all the samples..." "...larger than 1". The ratio  $\text{mean(MPF)}/\text{std(MPF)}$  is the signal to noise ratio, if You exlude the values with high SNR then You only include the uncertain data? Or did You mean the coefficient of variation  $\text{std(MPF)}/\text{mean(MPF)}$  instead?

C2

9) Conversion to Cartesian coordinates is mentioned. But is there a certain projection You are using. What are the units in the coordinate system (e.g. meters in which projection)? This is not very clear to me based on the manuscript.

10) You use the term Day of the Year, it is also often referred as the Julian day. I do not know which one is better in scientific articles, I have seen both practices.

11) P13 L534: "values held in Table 3...". Probably "values given in Tables 3 and 4" or "values held by tables 3 and 4" would sound better?

12) P15 L613: "accord" -> "accordance"?

13) P17 L697: "The influence different surface properties exert on the" -> "The influence exerted by different surface properties...".

14) Possibly You could also mention the bias correction approach of section 4.4. also in the final conclusion section (5.5.).

Sincerely,

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Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-35>, 2020.