

Interactive comment on “A long-term and reproducible passive microwave sea ice concentration data record for climate studies and monitoring” by G. Peng et al.

G. Peng et al.

ge.peng@noaa.gov

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We thank the Anonymous Referee #2 for the positive feedback and constructive comment and suggestions on our manuscript.

In the revised manuscript, additional information on the uncertainty of the estimates of annual means, annual minimum, and maximum are provided in term of ranges (minimum and maximum) and standard deviations along with simple examples of spatial variability of CDR and GSFC sea ice concentration fields.

Below is the one-to-one response to Referee #2's detail comments:

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Page 96, Line 17, “doi: 10.7265/N5B56GN3” not found in references

Reply: This is a result of the type-setting. Changed back to the original and unique link in the revised manuscript: <http://dx.doi.org/10.7265/N5B56GN3>.

Page 104, Line 14 “shading area of each month in Figure 4” should be Figure 5? (or dash lines in Figure 6?)..

Reply: Good catch. It should be Figure 5.

Page 106, Line 6 “. . . CDR provides similar spatial and temporal variability as the GSFC fields . . .” some documentation on the consistency of spatial variability, which is not evaluated, would be a great improvement of the presentation. For simple example, how is the spatial pattern in GSFC compared to Figure 2?

Reply: Good suggestion. Spatial distribution of sea ice concentrations from GSFC are added to Figure 2 and the discussion is added in Section 2.

Page 110, Table 1. All three rows have the same “Sensor” and “Swath Width”, by mentioning them in the caption or note would make the able a bit simpler.

Reply: Good suggestion. The “Sensor” and “Swath Width” columns are removed from the table and the values are mentioned in the first paragraph of Section 2.

Page 112, Figure 2. Daily snapshots likely contain high frequency variability and may bias the decadal variability, which can be checked via adding these three daily snapshot results to Figure 6. Also, it would be useful to show the area over the North Pole that is not measured by satellite sensor.

Reply: We agree with Referee #2 that daily snapshots likely contain high frequency variability that may bias the decadal variability. For the same reason, the monthly sea ice extents are used to examine the decadal trends as shown in Fig. 6 with annual range shown in Figs. 5 and 7.

The sea ice concentrations in figure 2 are in fact 5-day average centered on the day of

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the minimum sea ice extent and it is intended to be used as an example to illustrate the Arctic sea ice coverage change over the two decades. The figure caption is modified to reflect this fact. To mitigate the Referee's concern, we have replaced the 5-day average fields with monthly averaged fields. And the area over the North Pole that is not measured by satellite sensor is also shown.

Page 116, Figures 5 and 6, some information on the uncertainty of the monthly and annual mean values would be very useful.

Reply: Good suggestions. The values of mean, minimum, maximum, and standard deviation of the annual means, annual minimum, and annual maximum of 20-years monthly CDR sea ice extents are listed in the table II and III and discussed in Section 3.

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