

Author response to editor comments

(editor comments in black, author response in blue, all line numbers refer to the ones in the updated manuscript)

Editor comments:

Thank you for your comprehensive response to almost all reviewer comments. I did an editorial pass for typos/other grammatical things: All line numbers refer to the new document. Following these changes, I will be happy to accept the article for publication.

3: Change period after 16 to a comma

L.3 “[...] May. 16, 1977.”

18: replace periods with commas in the 6-digit numbers

L.18 “[...] differences of 240,000 and 590,000 km², respectively.”

A typo on line 28 (arctic without capital A)

L.28 “[...] the Arctic sea ice extent [...]”

An error has been introduced on new Line 149 in the Wentz reference format.

Thanks for pointing this out, we assume this is a typo and refers to new line 139, where we now have removed the brackets.

L.139 “The RTM uses the atmospheric part of the model described in **Wentz, 1997** to compute [...]”

Same on new line 167.

L.167 “[...] described in **Wentz, 1997.**”

201: Need a space before the start of the new sentence

L.201 “[...] in table 2. The distance [...]”

387 - 397: The suggestion from Reviewer 1 to remove the bullet points was a good one -- but I think your response isn't quite sufficient here. This list is still basically in bullet point format, but with the bullet points removed. I suggest that you rewrite this into one or two paragraphs -- not a series on single sentence, disjointed paragraphs.

Thank you for your time and effort put into reviewing this paper. We made the suggested changes to the final version of our manuscript as stated above and have rewritten the conclusion:

L.383-398 “

In this paper we presented a new SIC data set covering 1972-1977, by using the ESMR data from the Nimbus-5 satellite. The data set consists of resampled daily netCDF files for the Northern and Southern Hemispheres, respectively. SIC, associated uncertainties and processing flags are included in the data set. The uncertainties follow the same principles as the ones of the EUMETSAT SIC CDR, including both algorithm and re-sampling uncertainties. The choice of same land mask, spatial grid and projection as for EUMETSATs SIC CDR make comparisons between the time periods easier.

A comparison to NSIDC's ESMR SIC product and the OSI-SAF CDR showed that the seasonal pattern is very similar to NSIDC's ESMR SIC product, but our product shows systematically larger SIE values, which can not be explained by differences between land masks alone. For the Northern Hemisphere our SIE values are matching the levels of the 1980s of the OSI-SAF CDR with the same land mask, while values of the Southern Hemisphere have been larger in the 1970s than in the 1980s.

Compatibility with the EUMETSATs SIC CDR was achieved by using a similar processing chain. The processing included an atmospheric noise reduction with the use of an RTM and the ERA5 atmospheric data, which lowered the standard deviation of the TBs consistently. Additionally, dynamical tie-points were used to avoid biases from the RTM and NWP data as well as to adjust for seasonal variability and instrument biases. To ensure better data assessment in analysis and in models and easier comparison to other data sets, temporally and regionally varying uncertainty estimates have been included in our ESMR data set. ”