We would like to thank the Editor and the Reviewers for their useful insights and suggestions that have helped to improve the clarity of the manuscript. We provide here a point-by-point answer to all the suggestions. The number of figures and tables and the number of lines where text has been modified are referred to the updated version of the manuscript with track changes and our answers to comments are given blue text.

Comment on essd-2021-461
Anonymous Referee #1
Referee comment on "First SMOS Sea Surface Salinity dedicated products over the Baltic
Sea" by Verónica González-Gambau et al., Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2021-461-RC1, 2022

The paper describes the method to obtain the most precise and accurate sea surface salinity (SSS) measurements in the Baltic Sea, with the best spatial and temporal coverage, as provided by the SMOS satellite. The paper explains how this basin is not instrumented with any dense network of buoys which could provide good SSS mapping. Instead, satellite measurements have the right coverage but, because of the proximity of the coastlines and the existence of radio frequency interference sources, it is very difficult to obtain good quality SSS observations from space. The authors describe methodologically the processing steps taken to achieve good quality products of regional SSS maps of the Baltic Sea. The key steps are the use of the Meissner and Wentz dielectric constant of the salty water, and the characterization of systematic errors in SMOS observations in function of sea surface temperature. The results obtained are compared against those obtained from other data processors of SMOS as well as those used with SMAP, showing that their method provides the most accurate and precise salinities by comparison with in situ and ferry salinographs. These novel products are useful for a variety of applications. This reviewer recommends the paper for publication, after minor, mostly editorial changes (please refer to the attached reviewed paper). Please also note the supplement to this comment:
https://essd.copernicus.org/preprints/essd-2021-461/essd-2021-461-RC1-supplement.pdf

Thanks a lot to the reviewer for his/her revision. All the minor comments provided in the supplementary pdf file have been considered and included in the new version of the manuscript.

Besides, some figures have been changed to improve their readability, as suggested by the reviewer: Figures 3(b), 5 and 9 in the new version of the manuscript.

Two additional comments are answered below:

Lines 208-210: It is difficult to understand why the bins are larger than the range. One would expect the bins to be smaller than the range.

The introduction of the SST as another variable to classify SSS systematic errors reduces very significantly the number of measurements for each 6-tuple. With the objective of minimizing this reduction in the number of measurements, we have considered larger intervals of SST when computing the SMOS-based climatological data.

Lines 247-248: Could the authors provide the values of sigma_0? (just to let the reader understand how selective this restriction is).

It is important to point out that in the Baltic Sea, the presence of outliers highly impacts the estimation of the statistical parameters that characterize the SMOS-based climatological distribution, the m0 and s0 are computed in the interval [Q5,Q95]. Notice that each 6-tuple has its climatological distribution, that is, the m0 and s0 are computed per each 6-tuple. We present two examples of m0 and s0 for descending overpasses, $x = 0$ km and $\theta = 42.5^{\circ}$ for two different ranges of SST in the new version of the manuscript (Figure 6).