

Comment on essd-2021-239

Anonymous Referee #2

Referee comment on "Airborne SnowSAR data at X and Ku bands over boreal forest, alpine and tundra snow cover" by Juha Lemmetyinen et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2021-239-RC2>, 2022

The paper is a report on the data collected by SnowSAR. It is a report that gives the details of the sites, the SAR imagery and the ground truth. The report covers the essentials of the data

I suggest the following major revisions that will be useful for the readers and users of the data.

- It is well known that the microstructure such as grain size, SSA have a significant influence on the sigma0. It has more influence than snow density. The paper can give more weight to plotting and showing the results of grain size. The figure label on grainsize are hard to read. Please also draw curves to show the change of grain size with depth. Adding grain sizes to the tables of snow depth and swe, densities will also help.
- Snow wetness will dramatically reduce the usefulness of the approach. A table describing the wetness of each of the mission and the areas should be provided.
- There are more than 10 missions in Finland which are supposed to give a time series of sigma0. Since there are many parameters in swe retrieval, times series measurements will enhance the retrieval accuracy. However, the time series concept is not emphasized in the paper. The authors can add the time series evolution of microstructure, grain sizes, snow densities to figures 4 and 5.
- There will be many questions from users on sigma0, ground truth data etc. The section on data availability is too short. The authors should provide the contact person among the authors such as whom to contact for questions on Finland data, Alps data, TVC data etc.
- The sigma0 in the original AlpSAR data that is available from the ESA portal is not normalized. It would be helpful if the authors could add a short section on what the signal amplitude values mean in the original SnowSAR geotiff data. It will be useful for users who might be working with the geotiff amplitude files.
- The temporary link to access the gridded data (<https://www.pangaea.de/tok/e8c562c3c8a15ac34daa83d00c76fcb347330884>) in section 5 (page 43) does not work. If the authors could fix that, it will be helpful to

users who need access to the final data set.