Review comments

general comments

This work continues the author's previous research on the liquid water over Greenland. A radiative transfer model is implemented to generate a Lookup table to retrieve liquid water content during the melt season, and the retrieved results are compared with modeling results. The retrieved LWA shows a good agreement with the modeled results. This paper is of good quality, but I would like to ask a few questions before publication.

Specific comments

1. SMAP data sets. The authors chose the high-resolution SMAP data. What is the benefit of this data set in this research? In the discussion section, could the authors also elaborate more on the sentence"… overlapping observations to produce the 3.125 km gridded data but still has an effective spatial resolution of ~30 km"? How would this affect the results?
2. Permittivity of the wet firn. The author mentioned equation (3), and it seems the authors are using this equation to calculate penetration depth and absorption coefficients in the radiative transfer equation. Could the author discuss the equation used for calculating the effective permittivity?
3. Penetration depth of the wet firn. What would be a typical number and range of the penetration depth?
4. Layering model for the wet firn. Usually, the density profile in the percolation zone increases much faster than in the accumulation zone; the density can be close to the ice after a few meters, say 10m. I'm wondering how the authors deal with the varying density profile in the radiative transfer modeling, given that the penetration depth of 1% wet snow can be 10 meters based on the code provided in Microwave radar and radiometric remote sensing (by Ulaby and Long)?
5. Melt onset. The paper compares the melt onset with the modeling results. Could the auto weather stations provide any information (such as temperature) that can provide some ground truth evidence on the melt onset?
6. Better correlation between SMAP and EBM. In Table 1, the comparison between SMAP and EBM seems to be in agreement. Why is this so? Is this because EBM is using AWS data for calibration? If so, can GEMB somehow be calibrated by the AWS?
7. Possible overestimation of LWA by models. Figure 9 shows the comparison of measured and modeled temperature profiles. The modeled results seem to overestimate the temperatures and, thus, possibly the LWA. Any ideas on resolving this issue and validating the solution?

Thank you.