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Geoscientific Instrumentation Methods and Data Systems Discussions

Interactive comment on "Arctic Snow Microstructure Experiment for the development of snow emission modelling" *by* W. Maslanka et al.

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It is a really impressive experimental setup including the spectral range of the microwave radiometers (18.7 - 150 GHz) and the advanced instrumentation for measuring the snow microphysical properties. However, the analysis and the description of the measurements could be improved. I have two suggestions:

In table 3 it is mentioned that the snow physical parameters are average quantities and that means that there are MIN and MAX values, RMS, etc. I understand that the measurements are not all from the same spot, in any case there is spatial variability, and variability even within the sample, and measurement uncertainties. It would be nice to see an estimate of this variability together with the average values in table 3. Further,

how this uncertainty propagates through the models and affects the simulated brightness temperatures. It would also be nice to see the simulated extinction coefficients so that it would be possible to judge whether the differences in simulated extinction could explain the simulated Tb differences from the two models. Perhaps even figure out what extinction coefficient for a given model would be needed to reproduce the measurements.

On p. 502 it is noted "Other extinction coefficient relationships exist for the HUT model.." and also MEMLS has a whole selection of models for computing the scattering. I would suggest to try a couple of different scattering models to see if this could minimize the differences between simulations and measurements. This would also give a hint for future scattering model development suggested by you in the summary.

Interactive comment on Geosci. Instrum. Method. Data Syst. Discuss., 5, 495, 2015.