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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.

Anonymous Referee #2

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In this paper, the authors present a very useful experiment which provides radiometric, macro and microstructure measurements of a selection of homogenous snow slabs. An analysis of the measurements is given as well as some elements of evaluation using two state-of-the-art radiative transfer models. Overall, the manuscript is well organized and the analysis technique is sound. Even if more in depth analysis of the results is need, I wish to congratulate the authors for the huge amount of work to setup such an experiment. The paper deserves publication in the in Geosci. Instrum. Method. Data Syst. Discuss., once a deeper analysis of the results is performed according to the comments formulated hereafter.

- The paper needs a more in depth discussion about radiative transfer simulations and comparison with observations: (1) to better present model performances, (2) to

give more statistics: some scatterplots (Tb versus Sim) can be very useful in addition to bias/rms and correlation coeffs. (3) Authors could also try to add figures to plot time series of Tbs (obs, sim) at a given frequency together with some selected snow properties;

- 50 GHz frequency is increasingly used to monitor snowpack properties but was not considered in this study. Moreover no results are shown for 89 and 150 GHz. I must admit that this leaves me a bit dissatisfied since these frequencies have a potential for snow studies and are still under used. A dedicated discussion about the frequency dependence of RT models may be necessary. Regarding higher frequencies, do you have plans to study their potential in the near future?

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