



On the robustness of microstructure parameter retrieval from 3D images of snow for microwave modeling with SMRT

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For a faithful representation of snow in microwave modeling, the snow microwave radiative transfer (SMRT) model employs a characterization of snow microstructure in terms of an autocorrelation function (ACF). The library concept within SMRT allows for different functional forms of the ACF which all come with their own length and shape parameters that must be determined, e.g. by fitting the ACF to 3D image data from micro-computed tomography. This poses questions about uncertainties of the retrieval of microstructure parameters from fitting and their propagation into uncertainties in predictions of brightness temperature and radar backscatter. We address this problem by carefully revisiting the procedures of ACF fitting for a full tomography profile taken during the NoSREx campaign in Sodankylä and quantify the impact on active and passive simulations using SMRT.