

Interactive comment on “On the microwave optical properties of randomly oriented ice hydrometeors” by P. Eriksson et al.

Anonymous Referee #2

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Due to the nature of ice particle habits in clouds, arbitrary particle shapes and soft particle approximation (SPA) have been used for computing microwave scattering properties of ice particles. The present study reviewed two or three established databases of DDA calculations for microwave atmospheric radiative transfer. The authors also investigated the SPA and found that it is possible to define a SPA over narrow frequency ranges, while usages of SPA at higher size parameters may have problems. So the authors proposed an alternative to SPA, i.e., using the particle shape that was covered by the DDA databases and exhibits average single-scattering properties for the represent particle. The present results are important for understanding the effects of ice particles shapes on microwave optical properties for improving the single-scattering properties of ice particles with different shapes, refractive indices, and broader particle sizes and

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frequencies. The manuscript is well written and should be published after addressing one concern on comparing scattering properties from different sources. For example, the extinction/absorption efficiency is usually the normalized extinction/absorption cross section by the projected area of a volume-equivalent sphere for the scatterer. While some studies define the extinction/absorption efficiency as the ratio of the extinction/absorption cross section to the projected area of the scatterer under random orientation conditions, likes the ones used in Hong et al. [2009]. Please check if the extinction/absorption efficiencies were formatted to be consistent when doing the comparisons.

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