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Atmospheric Measurement Techniques Discussions

Interactive comment on "Snowfall retrieval at X, Ka and W band: consistency of backscattering and microphysical properties using BAECC ground-based measurements" *by* Marta Tecla Falconi et al.

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The paper and measurements presented are interesting but there is one important conclusion that is not adequately supported by quantitative analysis.

In particular, when discussing figure 13, the authors conclude:

"... i) looking at the product between the PIP-derived PSD and the radar cross section σ , we note that the TMM-based product is higher than the DDA one for small ice particles and is lower for the larger particles. The latter consideration leads to the conclusion that

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the soft-spheroid approximation may work rather well for computing radar reflectivity since the errors for larger particles are compensated by those for smaller particles."

This could not be true in general. It depends by the extreme of integration in terms of particle's diameter of the quantity σ*N(D) shown in figure 13 on the right side axis. If you integrate between 0 and 2.5 mm you will probably have a sort of compensation effect. This not likely happens if you consider larger integration limits. Unfortunately, the Authors do not report a figure where they show a statistic of N(D) measured from PIP to have an idea of typical show particle's range diameters for the considered case studies. They should add N(D) figure.

Minor: - why in figure 13, bottom panel Deq extends up to 14 mm whereas in the other panel it is up to 6 mm? - why DDA simulations starts from Deq =0.4 mm whereas TMM starts from approximatively 0.05 mm? Differences of σ*N(D) in that range of diameter can play a role.

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