

Atmos. Meas. Tech. Discuss., author comment AC1
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Reply to referee comment 1

Alan Geer

Author comment on "Physical characteristics of frozen hydrometeors inferred with parameter estimation" by Alan J. Geer, Atmos. Meas. Tech. Discuss.,
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Thank you for your review and for your comments. The issue of length is a good point and I will try to make any future work shorter. However it would be hard to cut anything out of the current manuscript at this stage; many aspects are already covered with less detail than would be ideal.

On the minor points, I will address all the typos in a revised manuscript, and I am very grateful for the pointer to the historic work with the T-28 storm-penetrating aircraft. The recent work using this dataset to describe hail PSDs (reaching up to at least 5 cm, Field et al., 2019) would clearly be a good future alternative for the PSD representing the "convective snow" category, rather than repurposing PSDs intended for other hydrometeor types, as done in the current work. In the revised manuscript I will adapt the relevant discussion on lines 228 - 235 to reflect this, and to acknowledge that some direct observations inside convective cores do exist; also perhaps mentioning the recent balloon-borne measurements of Waugh et al. (2020) if space permits. I will also try to fit this point into the discussion or conclusion of the revised manuscript, if at all possible.

References

Field, P.R., Heymsfield, A.J., Detwiler, A.G. and Wilkinson, J.M., 2019. Normalized hail particle size distributions from the T-28 storm-penetrating aircraft. *Journal of Applied Meteorology and Climatology*, 58(2), pp.231-245.

Waugh, S.M., Ziegler, C.L. and MacGorman, D.R., 2020. In Situ Microphysical Observations of a Multicell Storm Using a Balloon-Borne Video Disdrometer During Deep Convective Clouds and Chemistry. *Journal of Geophysical Research: Atmospheres*, 125(8), p.e2020JD032394.