

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

Alan Geer

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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.