

# General comment by the authors to Randy J. Chase:

We thank you for your time and effort in reading the manuscript and for the constructive comments and suggestion which we in the following address point by point (our answers are marked with blue font color).

## Short comment 1#

Randy J. Chase

The purpose of these comments are to enhance the original manuscript and are suggestions, not formal requests needed to be met for publication. I recommend the manuscript for publication based on the need for triple-frequency datasets in the planning of future spaceborne missions, which takes years of preemptive planning and novel observations. Please address the main concerns of the other reviewers and consider the following comments

1) Please consider adding recent work on triple frequency snow retrievals into your introduction and discussion:

Gergely, M., Cooper, S. J., and Garrett, T. J.: Using snowflake surface-area-to-volume ratio to model and interpret snowfall triple-frequency radar signatures, *Atmos. Chem. Phys.*, 17, 12011-12030, <https://doi.org/10.5194/acp-17-12011-2017>, 2017.

Chase, R. J., Finlon, J. A., Borque, P., McFarquhar, G. M., Nesbitt, S. W., Tanelli, S., et al. (2018). Evaluation of triple-frequency radar retrieval of snowfall properties using coincident airborne in situ observations during OLYMPEX. *Geophysical Research Letters*, 45, 5752–5760. <https://doi.org/10.1029/2018GL077997>

Leinonen, J., Lebsock, M. D., Tanelli, S., Sy, O. O., Dolan, B., Chase, R. J., Finlon, J. A., von Lerber, A., and Moisseev, D.: Retrieval of snowflake microphysical properties from multifrequency radar observations, *Atmos. Meas. Tech.*, 11, 5471-5488, <https://doi.org/10.5194/amt-11-5471-2018>, 2018.

Greco, M., Tian, L., Heymsfield, G., Tokay, A., Olson, W., Heymsfield, A. J. and Bansemer A. (2018). Nonparametric Methodology to Estimate Precipitating Ice from

Multiple-Frequency Radar Reflectivity Observations. JAMC, 57, 2605 - 2622 Yin, M., Liu, G., Honeyager, R., & Turk, F. J. (2017).

Yin, M., Liu, G., Honeyager, R., & Turk, F. J. (2017) Observed differences of triple-frequency radar signatures between snowflakes in stratiform and convective clouds. Journal of Quantitative Spectroscopy & Radiative Transfer, 193, 13–20. <https://doi.org/10.1016/j.jqsrt.2017.02.017>

**A: Thanks for the additional references, we added those reference in the introduction.**

2) Figure 8: The red-green colorbar is difficult to read for those who have a color deficiency. Please consider using a red-blue colorbar (python: 'seismic' or cmo-cean.cm.balance)

**A: Thanks for the suggestion, we adopted cmo-cean.cm.balance for the colorbar in this figure.**

3) Figure 9: Consider normalizing each vertical bin to the maximum frequency in that row rather than plotting the frequency. Also please cite the Yuter and Houze(1995) paper for readers who do not know how to read CFADs. See this reference for guidance:

**A: Thanks for the suggestion, we included the reference from Yuter and Houze(1995) in our manuscript. Regarding the normalization, we are already normalising each row following Yuter and Houze(1995) definitions.**

[http://olympex.atmos.washington.edu/publications/2018/JGR18\\_McMurdie-etal\\_TerrEnhancedPrecip.pdf](http://olympex.atmos.washington.edu/publications/2018/JGR18_McMurdie-etal_TerrEnhancedPrecip.pdf)