Review of "Consistency test of precipitating ice cloud retrieval properties obtained from the observations of different instruments operating at Dome-C (Antarctica)", by
Di Natale1, Bianchini, Del Guasta1, Palchetti, Bracci, Baldini, Maestri4 Cossich. Martinazzo, and Facheris.

This is an interesting article that uses REFIR-PAD Fourier transform spectroradiometer, MMR, lidar data and particle probe imagery for four case studies of precipitating ice clouds at Dome-C, Antarctica. The REFIR-PAD data are forward modeled to retrieve microphysical properties of the clouds, and then the results are compared to the MRR reflectivity data. The methodology described in this article provides ground-truth for satellite-based retrievals of ice cloud properties in Antartica.

I recommend considering my comments and modify the article appropriately before the article is accepted.

Main Comments

1. I'd like to see a sounding, or at the minimum, discussing the temperatures sampled for each of the four cases. This should be done in the abstract as well as in the body of the text.
2. An opportunity was missed to combine the MRR and Lidar data to derive the microphysical properties of the clouds sampled, using retrieval algorithms such as 2CICE, DARDAR and its successor. As it stands, the lidar data is not used for the analysis, maybe just to determine liquid water presence (?) and for the plots shown.
3. You could use the lidar data in the following way. Convert backscatter to extinction. Then, use the relationship between ice water content and extinction from the following article and those used in the study: Thornberry, T. D., Rollins, A. W., Avery, M. A., Woods, S., Lawson, R. P., Bui, T. V., and Gao, R.-S. (2017), Ice water content-extinction relationships and effective diameter for TTL cirrus derived from in situ measurements during ATTREX 2014, *J. Geophys. Res. Atmos.*, 122, 4494– 4507, doi:10.1002/2016JD025948.
4. The data from the ICE Camera offers an opportunity to derive particle masses from the melted diameter. The heated glass plate the particle land on provides that opportunity-initial diameter and melted diameter. The melted diameter may not be spherical but laboratory experiments could be conducted to find the relationship between melted diameter and spherical diameter.
5. The Doppler velocity data from MRR could be used to derive the median mass diameter.
6. The PSD dispersion is given as 7 on line 138. I suggest using a temperature-dependent dispersion, such as given in the article Ice Cloud Particle Size Distributions and Pressure-Dependent Terminal Velocities from In Situ Observations at Temperatures from 0 to -86C by Heymsfield et al. (2013).

Minor Comments

Reviewer R1 has noted improvements to the figures that should be made.

Line 101. What are the minimum and maximum altitudes sampled by the MRR.

102-103. What are the minimum and maximum reflectivities that can be measured by MRR.

138-139. Compare you sigma and mu values to those observed for cirrus clouds.

164: "to us"

166: Specifically, what are the temperatures of the clouds studied here.

216: How is liquid water detected from your instruments.

262. You have particle imagery to characterize the particle habit(s). How does this compare to the particle types interpreted from the analysis.

310: "provided" to "provide"

320: Specifically, what were the measured in-cloud temperatures?

Figure 11: To me, the relationship between Ze measured by MRR and that retrieved does not look very good. MRR reflectivites are quite flat whereas those from REFIR-PAD vary quite a bit.

Figures 13 and 16: Show fewer crystals in Figs. 11-12 so that they can be more easily identified by the reader

360, 361: remove "the" in "between the"

368. It would be nice to do some combined radar/lidar analysis or lidar analysis separately.

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