Liao, L., R. Meneghini, A. Tokay, and H. Kim, 2020: Assessment of Ku- and Ka-band Dual-frequency radar for snow retrieval. *J. Meteor. Soc. Japan*, **98**, 1129–1146. https://doi.org/10.2151/jmsj.2020-057

Plain Language Summary: Dual-frequency radars have been increasingly used for detecting and retrieving frozen precipitation. However, retrieval of snow parameters has two principal errors, namely, the differences between the assumed particle size distribution (PSD) model from the actual PSD and inadequacies in characterizing the single-scattering properties of snowflakes. This study is aimed at evaluating uncertainties of snow precipitation estimation associated with the PSD models and scattering models and understanding their respective contributions to overall uncertainties for gaining insight into how to improve the retrieval methods for the GPM DPR operating at the Ku- and Ka-bands.

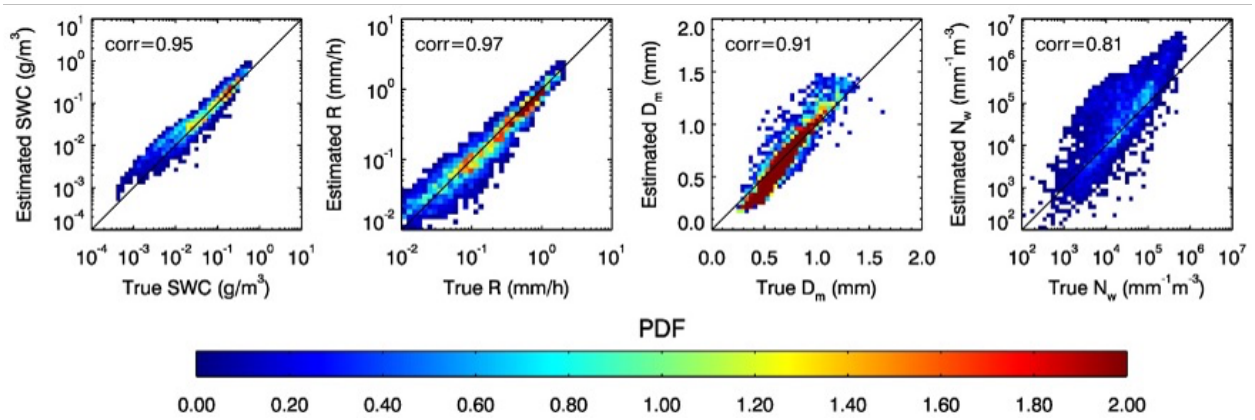

Figure 1. Two-dimensional probability density functions (PDFs) from the estimated and true snow parameters, including snow water content (SWC) (left panel), liquid-equivalent snowfall rate (R) (second panel from the left), mass-weighted diameter (D_m) (third panel from the left), and normalized intercept of gamma PSD (N_w) (right panel). Correlations denoted by corr and one-to-one relations (black curves) are given. The fixed $\mu = 0$ gamma PSD model is assumed, and the GSFC scattering database is adopted for retrieval.

- This study, based on radar simulations from observed PSD data, shows that there exist relatively high correlations between the estimated snow parameters and their true values derived directly from the measured PSD.
- A gamma PSD model with a fixed shape factor equal to 0 (or exponential distribution) provides the best estimates of liquid-equivalent snowfall rate and mass-weighted diameter.
- Use of an inappropriate single scattering table alone could cause at least 30%-50% changes in snow retrieval.