Objective: Validate GPM Drop Size Distribution Retrievals

Approach

Overarching method: Multi-regime, global disdrometer DSD "point" measurements are bridged to GPM DPR footprint/swath scales using GV dual-polarimetric radars (national network and Tier-1 research)

Results

Continental Scale comparisons confirm GPM meets basic DSD (D_m) science requirement... but

Broad physical consistency?

Impacts on convective rain?

Combined Algorithm?

Consistent representation of the DSD to include small D_m and light rain

4. Summary

GPM DSD retrievals satisfy basic science requirements. However some inconsistencies between GV, DPR and Combined algorithm retrievals exist in VS that impact rain rate retrievals in products in different ways and for different precipitation types. Underlying physics of DPR DSD behavior seem consistent with GV, but Combined algorithm retrievals behave differently. Impacts to rain rate retrievals are found when filtering for precipitation type and/or DSD. Continued validation of algorithm performance and GV approaches is required to a) verify consistent physics; b) assure the right answer for the right reasons; and c) improve general application of algorithm approaches as it pertains to form of the DSD (e.g., gamma vs. generalized gamma vs. ...).