# **Testing the DSD-based Stratiform - Convective Rain Separation for Ten Events in Greeley, Colorado**

Introduction: Our previous work (Bringi et al., 2009; Thurai et al., 2010; Thurai et al., 201 disdrometer measurements has consistently shown that it is possible to separate them in the N<sub>W</sub> -  $D_m$  domain, where N<sub>W</sub> is the normalized intercept parameter, and  $D_m$  is the mass-weighted mean diameter. Testing was done in three locations: Darwin (Australia), Huntsville (Alabama), and Ontario (Canada). Here we consider events in Greeley, Colorado, where a measurement campaign was conducted from April-Oct 2015 (Thurai et al. 2017).

### **Greeley Measurement Campaign**

The campaign entailed: a 2D video disdrometer (2DVD), a meteorological particle spectrometer (MPS), a pluvio gauge, all installed inside a DFIR, located 13 km SSE of the CSU-CHILL radar.





### 2015 Greeley rain events to test S-C separation

2015	UTC	Rain type over Easton
17 April	03:23	Very thick BB, 200 m a.g.l
17 April	09:17	BB at 1 km a.g.l.
17 April	18:55	Modest thunderstorm
23 May	20:47	Very heavy rain
08 May	17:35	BB at 1 km a.g.l.
08 May	20:49	BB at 1.5 km a.g.l.
09 May	17:17	BB at ~1.2 km a.g.l.
19 May	09-16 hr	Long duration
23 May	20:27	Convective
29 May	21:16	Not very clear BB, but at $\sim$ 1.5 km a.g.l.
29 May	23:23	Convective cell reached Easton at 23:38
26 June	08:12	Convective

### **17<sup>th</sup> Apr 2015 event**: A variety of rain types



One minute DSDs, averaged over 3 minutes, are used to derive  $N_W \& D_m$  and compared with our separation line. CHILL RHI scans are used to confirm. The instrument site is marked with  $\triangle$ in the dBZ and LDR plots.





M. Thurai, P. C. Kennedy, B. Dolan, and V. N. Bringi Colorado State University, Fort Collins, Colorado, USA



MT acknowledges support from NASA's Global Precipitation Measurement program through Award NNX16AD47G.

CHILL RHI over the disdrometer (13 km range)

### **Acknowledgments**

# 6. Conclusions

The 2015 rain measurement campaign in Greeley has enabled us to test the DSD-based separation technique for stratiform and convective rain.

Out of the 10 events chosen (rain-dominated), 9 were in good agreement. The remaining one case appeared to be a 'mixed' event over the disdrometer site.

The effect of incorporating the MPS data (with higher accuracy of small drops concentration measurements) resulted in somewhat lower values of D<sub>m</sub> for a few cases (mostly for low rain rate cases). The separation technique still appears to be applicable.

### References

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