Validation of Hail Detection in the 26 May 2010 Denver, CO, Hailstorm Using Dual-Polarization Radar

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ABSTRACT

On 26 May 2010, a severe, long-lasting hailstorm in the Denver, CO, metro area produced large hail, up to 2.75" in diameter according to the Storm Prediction Center (SPC), and a few small tornadoes. The environmental profile on that day was favorable for development of thunderstorms. Both the Colorado State University-CHILL (CSU-CHILL) radar and the National Weather Service Weather Surveillance Radar-1988 Doppler (WSR-88D) in Denver (KFTG) captured the storm on radar as it passed. In this study, polarimetric variables from the CSU-CHILL radar are paired with hail reports from the SPC in order to validate CSU-CHILL's ability to verify ground reports of hail, and to demonstrate improved hail detection due to polarimetric capabilities. Overall, the CSU-CHILL polarimetric variables consistently coincide with hail report locations. In addition, the CSU-CHILL polarimetric variables indicated hail within a kilometer of spotter hail reports. This study helps confirm that dual-polarization capabilities will be an excellent addition to operational radar.