

Hail storm features using C-band polarimetric radar in Delhi and associated atmospheric energetic

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Intense convection contribute in a significant way to heat transfer, tropospheric-stratospheric exchanges, precipitation and development of a severe weather system. Presence of western disturbances over North Pakistan or J&K modulate the weather system over Delhi/ Haryana/Punjab provided by westerly trough or by jet maxima which causes hail storm occurrence over the region. Main objective of the present work is to study Hail Storm features as seen by polarimetric C-band radar and associated convective parameters. Study is carried out for 4 events during the year 2012-13. Study region is Delhi and its surrounding region. For this purpose Z_h and Z_{dr} and ρ near surface level, Maximum Echo Top Height (ETH) parameter of storms with three reflectivity thresholds 20, 30 and 40 dBZ and Vertically Integrated Liquid (VIL) are considered. Many studies have demonstrated that dual-polarimetric radar is an effective tool for hail detection. Studies employing radar at C band is typically characterized by high Z_h (>50) and high Z_{dr} (3-8 dB) at just above the ground. Associated environmental parameter such as temperature profile, Freezing level, Convective Available Energy (CAPE), Convective Inhibition (CIN) and vertical windshear, moisture profile are studied with the help of sounding observations. A complex nonlinear relationship between the hail proxies and the environmental parameters are observed. This study will help to understand genesis of hailstorms over the region in a better way.