Preliminary Single Doppler Radar Analyses of U.S. Central Gulf Coast Pulse Severe Thunderstorms and Associated Basic Evolutionary Characteristics

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Using WSR-88D single Doppler Level-II Data within the Gibson Radar Level-II Analyst Platform, this study analyzed six U.S. Central Gulf Coast pulse severe thunderstorms occurring under weak 0-6 km vertical wind shear (<.004 s^{-1}) and relative high thermodynamic instability [>2000 J kg^{-1} mixed-layer convective available potential energy (MLCAPE)] conditions. The purpose was to improve radar warning lead time and reduce false alarm**.** The average total time from initial appearance of an updraft until the peak divergence signature was 22 minutes. The average elapsed time from maximum updraft intensity (t_0) until peak divergence signature appearance at the lowest elevation slice was 13 minutes. Two-thirds of the cases displayed a peak near-surface divergence by t_o+2. All six cases exhibited similar kinematic flow patterns of updraft low-level convergence between t_o-2 and t_0, updraft upper-level divergence between t_o-2 and t_o+1, and finally updraft low-level divergence became evident by t_o+1. Half of the pulse severe thunderstorms in this study were associated with 'primer storms. Finally, (5/6) cases exhibited pre-cursor updraft mid-level convergence ~5-10 kft below the mid-level maximum reflectivity core ~5 min before the surface divergence signature appeared.