Hail Spatial and Temporal Observing Network and from (top RaXPol 30 from KOUN on 23 May 2011 and 29 May 2012 (equivalent potential temperature is shaded). (b) 500 mb analysis (courtesy of the Storm Prediction Center) and (c) Norman sounding valid 0000 UTC 24 May 2011. The black star in (a) marks Gotebo, OK.

Distributions of hail with fixed mass content of 2 g m\(^{-3}\) as a function of hail size and fractional water content at S, C, and X bands. The scattering amplitudes were calculated using a two-layer T matrix method; the hail is modeled as a solid ice core with a liquid water shell. Mean canting angle is assumed to be 0º, with a distribution of canting angles extending to Z\(\rho_{hv}\) near BWER (KOUN).

Fig. 6. Reconstructed vertical cross-sections of \(Z_h\) and \(\rho_{hv}\) from KOUN near 2223 UTC showing a BWER, echo overhang, and very deep region of reduced \(\rho_{hv}\) extending to nearly 13 km in height.

Fig. 7. The minimum \(\rho_{hv}\) on the 3.1, 4.0, and 5.1º elevation angle scans near or within the BWER.

Reductions in \(\rho_{hv}\) aloft tended to occur 4–8 km higher before the largest hail observed on the ground. A scatterplot of \(Z_h\) vs. \(\rho_{hv}\) (colored by \(\rho_{hv}\) valid 2259/31, the encircled points likely represent hail.

Fig. 8. Reconstructed vertical cross-sections of \(Z_h\), \(\rho_{hv}\) and \(Z_R\), from RaXPol valid near 2250 UTC reveals a deep low reflectivity ribbon and very prominent three-body scatter signature to the rear of the supercell.

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