

The evolution of a tornadic supercell based on data from a mobile, rapid-scan, X-band, polarimetric Doppler radar and a WSR-88D radar, integrated with cloud-top features viewed by a rapid-update, geosynchronous satellite

*Howard Bluestein¹, Dylan Reif¹, Zachary Wienhoff¹, Daniel Lindsey², Daniel Bikos³

1. School of Meteorology, University of Oklahoma, 2. NOAA/NESDIS, 3. Cooperative Institute for Research in the Atmosphere (CIRA)

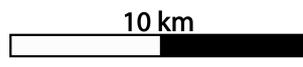
This paper is a study of a tornadic supercell in Kansas on 14 May 2018 in which data of relatively high spatio-temporal resolution from a mobile, polarimetric, X-band, Doppler radar (RaXPol) and data of lower spatio-temporal resolution from a WSR-88D radar were integrated with high-resolution, rapid-update, GOES-16 visible and IR data. The data - collection period spanned the early life of the storm from when it was just a series of ordinary cells, with relatively low cloud tops, through its evolution into a supercell with much higher cloud tops, continuing through the formation and dissipation of a brief tornado, and ending after the supercell came to a stop and reversed direction, produced another tornado, and collided with a quasi-linear convective system. During the latter portion of the multicell phase through the first tornado of the supercell phase, the highest cloud top was displaced about 10 km, mainly to the north or northeast of the main updraft, as evidenced by the locations of BWER and Z_{DR} columns. Subsequently, the updraft and the cloud top became more closely located to the updraft and then jumped ahead, consistent with what would be expected during cyclic mesocyclogenesis. No relationship was apparent between changes in the highest cloud - top height and tornadogenesis, but changes in cloud - top heights (rapid increases and rapid decreases) were related to two phases in multicell evolution and to supercell formation.

Keywords: tornadic supercell, polarimetric Doppler radar, mobile rapid scan radar, ZDR column

14 May 2018

Times (UTC)	
	2221
	2253
	2311
	2321
	2336
	2346
	0000
	0019
	0034

- IR Top Track
- Visible Top Track
- Z_{DR} Column Track
- BWER Track



Kansas

