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A case study of supercell thunderstorm merger and tornadogenesis

On May 4, 2003, a record outbreak of tornadic supercells struck portions of the central United States. In Missouri alone, 38 tornadoes were documented, setting not only a new single day record, but a new monthly record of tornadoes. An interesting feature of this outbreak involves the evolution, interaction and merger of cells that produced a tornado in Southwest Missouri that devastated the town of Pierce City. This paper presents results from an analysis of the evolution of the storm using radar data. The analysis concentrates on the impact of the merger of two storm cells on the intensity of the tornado. The Doppler radar analysis shows that there was increased intensity and rotation of the main storm prior to the merger, and a very intense resulting thunderstorm with very strong rotation signatures.