

ATS/CIRA Colloquium

Matthew Parker

Visiting ATS from NC State University

**How Well Can We Explain Why Some Supercells
Make Tornadoes and Others Do Not?**

Hosted by Russ Schumacher

Friday, Nov. 3, 2017

ATS room 101

Discussion will begin at 11:15 a.m.

Refreshments will be served at 10:45 a.m. in the weather lab

It has long been known that most significant tornadoes are produced by supercell thunderstorms, and yet the majority of supercells are non-tornadic. The environmental soundings near tornadic vs. non-tornadic supercells from VORTEX2 reveal a number of discrepancies that may be physically meaningful. For example, new idealized simulations of supercells using these tornadic vs. non-tornadic VORTEX2 soundings exhibit rather different evolution. An ensemble of simulated supercells in the tornadic environment produces intense tornado-like vortices in every case. An ensemble of simulated supercells in the non-tornadic environment produces non-tornadic storms in the vast majority of cases, even though this environment would still be viewed as favorable for tornadoes by conventional operational indices. A challenging problem is to explain the physical linkages between the observed environmental differences and the resultant changes to the internal storm processes that might lead to tornadogenesis. This talk will describe the distinctive elements of the composite VORTEX2 tornado environments, the character of the simulated supercells produced within the tornadic vs. non-tornadic composite environments, and a hierarchy of idealized studies designed to address the question: what are the fundamental environmental requirements for producing tornadic surface vertical vorticity in a storm?

Link to colloquia page: <https://www.atmos.colostate.edu/colloquia/>