**Improving Understanding and Prediction of High Impact Weather Associated with Low-Topped Severe Convection in the Southeastern U.S.**

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Severe convective storms in environments with large vertical wind shear and marginal instability (so-called “high-shear low-CAPE”, or “HSLC” events) represent a significant short-term, high-impact forecasting and warning challenge, particularly in the Southeastern, Mid-Atlantic, and Ohio Valley states of the U.S. Such environments account for a substantial fraction of severe wind and tornado reports in the region, and they are present for many hours each year. Previous research has elucidated several potentially useful environmental ingredients for discriminating between HSLC significant severe weather events vs. null cases, and also several potentially useful radar signatures for discriminating between tornadic and non-tornadic HSLC vortices at close range. Unfortunately, there is only a cursory understanding of the basic dynamics of HSLC storms, and there has also been no thorough assessment of how well HSLC events or environments are predicted by numerical weather prediction (NWP) models.

The long-range goal of the research team on this project is to work with our NOAA partners to improve predictions and warnings for hazardous weather in HSLC environments. The goal of the present research is to address gaps in the HSLC knowledge base through the following set of complementary projects:

1) HSLC process study using modeling and emulated radar sampling
2) Operational NWP resolution and sensitivities study using HSLC event hindcasts
3) Predictability study using ensembles and dynamical-statistical downscaling
4) Operational assessment of HSLC forecasting composite parameters

This presentation will explore the preliminary findings of the work thus far and avenues for future research into HSLC severe convection."