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Marcus L Bükér* (m1-buker@wiu.edu), Dr. Marcus Bükér, WIU - Department of Geography, 1 University Circle, Macomb, IL 61455. "*Vortex interactions and superhelicity in tornadic supercell thunderstorms*".

This talk will focus on diagnostic methods for localized, barotropic vorticity evolution in tornadic supercell environments. These methods identify local maxima in vorticity tendency, and how these features relate to a quantity known as superhelicity, which is present whenever spatial gradients in horizontal vorticity (such as those associated with downdraft and updraft pulses) are orthogonal to a given background vorticity (such as in the vicinity of a mesocyclone). Using mobile Doppler radar retrievals from two observational cases featuring tornadic supercells, these diagnostic methods show promise for tracking coherent dynamical features related to surface vortex intensification, as well as potentially detecting signals of imminent tornadogenesis sooner than traditional vorticity tendency diagnostics. Furthermore, these methods may provide physical insight into vortex interactions and modes in the vicinity of the mesocyclone and flanking downdrafts. Numerical simulations will also illustrate these relationships through idealized vortex interactions. (Received August 30, 2016)