Cyclic mesocyclogenesis is the process by which a supercell produces multiple mesocyclones with similar lifecycles. This process is physically representative of the current understanding for cyclic supercells.

**Background/Methodology**

- Cyclic mesocyclogenesis is the process by which a supercell produces multiple mesocyclones with similar lifecycles (Adlerman et al. 1999 JAS).
- Two types of cyclic mesocyclogenesis: occluding (OCM) and nonoccluding (NOCM, Adlerman and Droegemeier 2002, 2005 MWR).
- Three experiments were performed to test the sensitivity of cyclic mesocyclogenesis to horizontal grid resolution, physical parameterizations, and environmental effects.
- 4 cases of cyclic supercells are analyzed to compare with NEWS-e forecasts:
  - 9 May 2017 – Morton Supercell
  - 16 May 2017 – Elk City Supercell
  - 18 May 2017 – Corn and Hennessey Supercells
- Control observations are found by analyzing WSR-88D data (e.g. Thompson et al. 2012, Smith et al. 2012 WAF).

**Case Observations**

Mesocyclone tracks for all of the supercell cases analyzed in this study: a) Morton supercell, b) Elk City supercell, c) Corn supercell, and d) Hennessey supercell. The type of cyclic mesocyclogenesis is overlaid above the path in the individual panels, and each mesocyclone is color-coded.

**Summary**

- **Cycling** is observed at 3 km, but is more frequent at 1 km.
- As the number of control (observed) cycles increases, so does the number of cycles predicted by 1-km forecast members.
- **NEWS-e** is able to forecast the potential for cycling, but shows little to no skill in predicting the timing compared to observations.
- 1-km members predict the existence of a supercell for longer periods of time, but are not necessarily more accurate.