6a.9 Dual-polarization radar data simulator for the WRF Model

Jung, Youngsun, Daniel Dawson, Timothy Supinie, and Marcus Johnson, *University of Oklahoma*

Polarimetric measurements are proven to help improve precipitation-type classification and quantitative rainfall estimates. They are also extensively used to understand the time evolution, microphysical characteristics, and dynamics and thermodynamics of precipitation systems. Although observations offer important insights into storms, numerical models allow users to study details that are not directly observed with high-temporal and high-spatial resolutions. They can also help substantiate finding from observational studies and can be used to develop new theories. Several past studies showed that they can be very helpful in validating numerical weather forecasts and improving microphysical parameterizations and can help enhance our understanding of the interactions between microphysics and kinematics in severe storms and the mesoscale system.

To facilitate direct comparisons between model output and radar observations, a generic CAPS has developed a polarimetric radar emulator for the numerical weather prediction models based on rigorous scattering calculations using the T-matric method for reflectivity (ZH), differential reflectivity (ZDR), specific differential phase (KDP), and copolor cross-correlation coefficient (ρhv). Currently, it can ingest WDM6, Morrison, Millbrandt-Yau, Thompson, and NSSL schemes in the WRF model. It is a stand-alone program whose user interface is written in Python. I will present various user options and some examples of its application at the workshop.