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Systematic Validation of Ensemble Cloud-Process Simulations using Polarimetric Radar Observations and Simulator over the NASA Wallops Flight Facility

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The BiLateral Operational Storm-Scale Observation and Modeling (BLOSSOM) project was initiated in order to establish routine storm-scale polarimetric radar observations and cloud-process modeling at NASA GSFC Wallops Flight Facility (WFF), where various continental and maritime convective systems are being observed. The ultimate goals of BLOSSOM include:

- *Establish a long-term super site to improve understanding of cloud physical states and processes over the WFF site through bilateral storm-scale observations and modeling.*
- *Provide routine meteorological large-scale forcing input to support cloud-resolving models (CRMs), large-eddy simulation (LES) models, and single-column models (SCMs) for the improvement of cloud microphysics and convection parameterizations.*
- *Provide routine storm-scale cloud-precipitation simulations as well as storm-scale measurements using ground-based polarimetric Doppler radar and in-situ data.*
- *Collect and organize value-added data from the cloud-process simulations, ground-based polarimetric radar, and NASA satellite observations for the community.*

This presentation will highlight a few case studies to test the concept of BLOSSOM, including the creation of ensemble large-scale forcing, configuring and performing cloud-process simulations with different bulk microphysics using the Goddard Cumulus Ensemble (GCE) model, organizing and streaming NASA S-band dual-POLarimetric radar (NPOL) and other WFF instrument data, and validating the ensemble GCE simulations through formulating statistical composites by comparing observed and simulated polarimetric radar signals using the POLarimetric Radar Retrieval and Instrument Simulator (POLARRIS). Different spatial grid spacing (1km vs 250m) of the GCE simulations will be also evaluated to examine resolution impact on representing time-series as well as time-integrated composites of polarimetric radar signals.

