Comparison of Model Results of Hurricane Earl (2010) and the APR-2 Dual-frequency, Dual-polarization RadarData Collected During the NASA GRIP Investigation

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This presentation will show the results of simulations of Hurricane Earl (2010), that interacted with the SAL (Saharan Air Layer), during the stage when it intensified from a tropical depression into a Cat-4 hurricane. A focus of the study is on how the dust aerosol impact the track, intensity, and intensification of Earl. Given the complexity of aerosol effects on cloud microphysics and radiation and their subsequent effects on deep convective clouds, there is a need to assess the combined aerosol effects of microphysics and radiation. We will use the NASA version of the Weather Research and Forecasting (WRF) model with interactive aerosol-cloud-radiation physics to study the influence of Saharan dust on Earl. The impact of Saharan dust is evaluated by looking at the differences between simulations with and without aerosol and by a series of comparisons between model simulated radar reflectivities and the Airborne Precipitation Radar (APR-2) radar data. The APR-2 is a dual-frequency (13 GHz and 35 GHz), dual-polarization Doppler radar system that collecteddata in Earl during the NASA Genesis and Rapid Intensification Processes (GRIP)field campaign in 2010.

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