

6A.2 Testing and evaluation of the GSI-Hybrid data assimilation and its applications for high-resolution tropical storm forecasts

Zhou, Chunhua, Hui Shao, *National Center for Atmospheric Research*; and Ligia Bernardet, *National Oceanic and Atmospheric Administration*

In collaboration with research and operational centers, the Developmental Testbed Center (DTC) works toward the improvement of Data Assimilation (DA) and initialization of numerical models for tropical cyclone forecasting. Recent work has been performed in the framework of the 2013 operational Hurricane Weather Research and Forecast (HWRF) model, which employs a hybrid variational-ensemble configuration of the Gridpoint Statistical Interpolation (GSI) system for both the parent domain (27km) and inner nest (3km).

Multiple cases of tropical storms have been run to investigate various aspects of the GSI-Hybrid DA system, with a focus on the ensemble selection for the vortex-scale data assimilation. As part of the effort to advance the GSI-Hybrid DA system and initialization in HWRF, diagnostics have been performed to study the impact of numerous configurations on hurricane forecasts, including the benefit of applying high resolution regional HWRF ensemble for the vortex scale DA, and the impact of DA and vortex initialization.