



Assimilation of Satellite and Radar Data Toward Improving Numerical Simulations of Tropical Cyclones

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This presentation highlights a few example research results from assimilating satellite and radar observations during recent tropical cyclone field programs (e.g., TPARC/TCS-08, RAINEX etc.) to demonstrate the impact of data assimilation on the predictability of tropical cyclones. It also shows how the availability of in-situ data from dedicated field programs allows the validation of the satellite data over oceans during tropical cyclone events. The impact of the quality of satellite and radar data on numerical simulations of tropical cyclone is also examined.

With community weather research and forecasting (WRF) model and its variational data assimilation systems and the ensemble Kalman filter method, results indicated that: 1) dedicated field programs provide good opportunities to evaluate and demonstrate the impacts of satellite and radar data on improving numerical simulations/forecasts of tropical cyclones. 2) In-situ observations obtained from the field programs provide excellent sources to validate the quality of satellite products, thereby enhancing our ability to more effectively assimilate this data in numerical weather prediction of TCs. 3) The resulting improved analyses can then help us to better understand and predict the behavior of tropical cyclones.