Ensemble Kalman Assimilation of Global-Hawk-based Data from Tropical Cyclones

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This study utilizes an ensemble Kalman filter (EnKF) the impact of assimilating observations taken over and around hurricanes from the NASA Global Hawk unmanned airborne system. The EnKF has recently proven to be an effective tool for initializing hurricane vortices, and the Global Hawk flies above hurricanes and has the benefit of a 25-30-h flight duration, which is two to three times that of conventional aircraft. The long duration of the Global Hawk gives it a much larger range and on-station capabilities than conventional aircraft, making it a desirable addition to other observing platforms. Observations of interest include radial velocity from the High-altitude Imaging Wind and Rain Airborne Profiler (HIWRAP), Advanced Vertical Atmospheric Profiling System (AVAPS) dropsondes, and water vapor and temperature profiles from the scanning High-resolution Interferometer Sounder (S-HIS). We will examine the impact of assimilating thinned "super observations" in terms of analysis accuracy and forecast improvement as a result of assimilation. A comparison is made between assimilating simulated and real HIWRAP data.