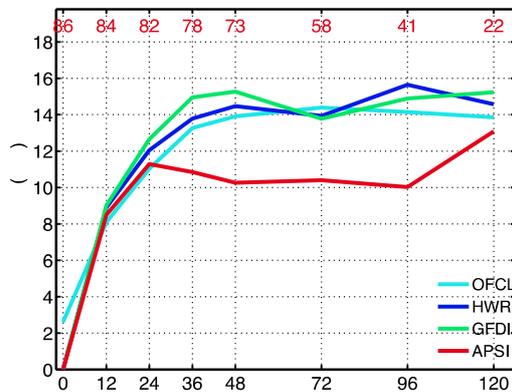
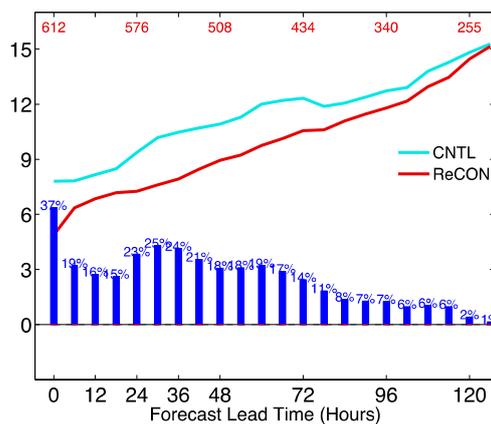


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← Figure 1. Mean absolute hurricane intensity forecast errors in term of maximum 10-m surface wind speed (unit: knots) by homogeneously comparing the PSU WRF-EnKF deterministic forecasts through assimilation of airborne reconnaissance Doppler radar data (APSI, red) with the NHC official forecasts (OFCL, cyan) and NOAA's operational regional dynamical models of HWRF (HWRI, blue) and GFDL (GFDI, green) during 2008-2012. (Adapted from Zhang and Weng, 2015 BAMS).



↙ Figure 2. Mean absolute hurricane intensity forecast errors in term of minimal sea-level pressure (unit: hPa) in homogeneous verification averaged over all 636 applicable cases during 2008-2012 for CNTL (cyan, deterministic forecasts from the PSU WRF-EnKF analysis without reconnaissance data assimilation) and ReCON (red, same as CNTL but with assimilation of reconnaissance observations). The blue bars on the bottom mean the improvement of ReCON in percent over CNTL, and the numbers of homogeneous samples are list on the top of the panel.

- Overviewing of the recent advances in analysis and prediction of tropical cyclones through assimilation of reconnaissance aircraft observations; and designed a cycling WRF-EnKF analysis and prediction system to evaluate the impact of airborne reconnaissance data assimilation on hurricane intensity forecast.
- Assimilating of reconnaissance data shows positive impacts on both hurricane track and intensity forecasts with an reduction of 2~14% for position forecast errors and 1~37% for minimal sea level pressure forecast errors for forecast lead times 0~126 h, and 1~11% for maximal 10-m wind speed forecast errors during the 24~114 h lead-times averaged over all 636 applicable cases during 2008-2012.
- The aircraft hurricane reconnaissance data is now routinely assimilated into the operational hurricane forecast model HWRF performed at NOAA.