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Typhoon Track Forecast with a hybrid GSI-ETKF data assimilation system

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A hybrid Grid-point Statistical Interpolation-Ensemble Transform Kalman Filter (GSI-ETKF) data assimilation system for the WRF was developed and applied to typhoon track forecast with simulated dropsonde observations. By examining the analyses and the follow-up forecasts, a significant improvement of this hybrid system over the GSI system on tropical cyclone track forecast was found in the cases of Muifa in 2011. Further analyses revealed that the flow-dependent ensemble covariance is the major contributor to make the performance of the GSI-ETKF better than the standard GSI through systematically adjusting the position of the typhoon vortex and better updating the environmental field.
Keywords: data assimilation, hybrid, tropical cyclone