Impact of Quality Control and Data Thinning of GPS RO Data in WRF-Var on Typhoon Track Forecast

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Abstract

In this study we attempt to improve vertical data thinning and quality control methods of COSMIC GPS radio occultation (RO) data in WRF-Var system. The vertical resolution of GPS RO data is finer than that of NWP models so vertical data thinning is applied to remove features which cannot be resolved. The quality control conditions used in NCEP GSI system are implemented and some modifications are examined.

We also assess the impact of GPS RO data on track forecast of typhoon events affecting Taiwan with Advanced Research WRF model and the Forecast Sensitivity to Observations (FSO) utility developed by UCAR. Our results show some improvement of statistics of RO data innovation and track error reduction with modified data arrangement in WRF-Var and the contribution of GPS RO data among all observations is obvious, especially at 06 and 18 UTCs when the sounding data are fewer.