On the Impact of Initial Field upon Numerical Simulations of Typhoon Cases

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Abstract

Numerical models on typhoon forecast and research are essential, however, they are plagued by the uncertainty of initial state of atmosphere. Therefore, the improvements of initialization procedure such as vortex implantation, data assimilation are very important to the typhoon track and intensity predictions (Xiao et al., 2000). Meanwhile, ensemble forecasting or multimodel superensemble provided the highest forecasting skill (Krishnamurti et al, 1999).

This study conducted a serious of typhoon predictions by using the CWB nonhydrostatic forecast system (NFS), and the Penn State/NCAR MM5 model with different initial fields. The model simulated at a 45km/15km/5km nested grid and 31-level sigma coordinate. Each model run is 72 hours. The initial fields tested here were generated by the CWB global forecast system (GFS) and the NCEP global model (AVN), respectively. We also tried to investigate the impact of bogussing vortex intensity upon typhoon forecast. Consequently, base on the different models, initial fields and bogussing vortex intensity, typhoon cases were simulated for a period during which a typhoon is located in the vicinity of Taiwan. There were evidences that it was reasonable to present better performance with more realistic initial filed. With the difference models, initial condition, and bogussing scheme, the ensemble forecasting results in small forecast errors, indicating its ability to improve typhoon prediction in Taiwan area.