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The Model for Prediction Across Scales (MPAS) is a global model with non-hydrostatic atmospheric solver, and it has unstructured variable resolution meshes with smoothly-varying mesh transitions, those would be well-suited for a higher-resolution mesoscale atmosphere simulation. For a typhoon prediction, the Global Positioning System (GPS) radio occultation (RO) data has a global distribution, high vertical resolution, and high accuracy, that could provide useful data for the numerical weather prediction, especially for the information over the ocean. Thus, we use the global Gridpoint Statistical Interpolation (GSI) system for the RO data assimilation and connect the system with the MPAS model. The MPAS-GSI system has been built up preliminarily.
Typhoon Nepartak is the first cyclogenesis over the Northwestern Pacific Ocean in 2016, which generated in early July and rapidly developed. In early July, a 5-day track prediction from most of the operation weather centers showed a northwestward deflection and predicted no landfall in Taiwan. In this study, we assess the performance of MPAS-GSI model on the Typhoon Nepartak (2016), and the assimilation with GPS RO data shows a smaller track error than the data denied run. Assimilations with different GPS RO forward operators will be discussed as well.
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