

Simulation skills of the Unified Model 3.0 (UM3.0) for heavy rainfall over South Korea

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As the computational abilities improve, resolution of numerical weather prediction (NWP) model has been steadily increasing. Compared with a lower resolution model, a higher resolution model can simulate more detailed atmospheric phenomena related with precipitation. Therefore, a higher resolution prediction model is commonly used for short-term weather forecast and developing a higher resolution model is one of the important issue for improving weather forecast. In the same vein, the Korean Meteorological Administration (KMA) is operating the Unified Model(UM), the numerical prediction model, which is introduced from the United Kingdom Meteorological Office (UKMO). Through the operation of the UM, the KMA is providing various weather prediction information such as Global Data Assimilation and Prediction System (GDAPS), Regional Data Assimilation and Prediction System (RDAPS), Local Data Assimilation and Prediction System (LDAPS), UM3.0 and so on. Among them, UM3.0 has been using for medium-term forecast by the KMA. The UM3.0 has 3km of spatial resolution and 1-hour time resolution providing 7days prediction information from the beginning point of prediction time. In this study, we aimed to evaluate the predictability of the UM 3.0. As the UM 3.0 provides the data for medium-term forecast, we focused on the evaluation of typhoon events with heavy rainfall during 2014 and 2015. For the study, preprocessed QCF (Quality Control by Fuzzy method) radar data which have same grid-point were used and we used three statistics such as root mean square error (RMSE), correlation coefficient, and bias to quantify the temporal and spatial accuracy of the model.

Keywords: UM3.0, numerical weather prediction model, simulation skill