中央氣象局對流尺度資料同化系統之發展現況
Current status of the CWB operational convective-scale data assimilation system

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摘　　要

提高短延時、強降水天氣事件的預報能力，除了需要高解析度、先進的數值預報系統之外，如何擬訂適當的資料同化策略以結合高更新頻率的觀測資料，佐以持續精進的資料同化技術，，是提升極短期預報效能的重要關鍵。

台灣地區具有高密度雷達網與地面觀測資料系統，可提供降水系統之科學研究、監測與災害預警等，亦可提供即時觀測資料於模式應用，以改進短期定量降雨預報。由評估發現，在對流尺度資料同化系統中，結合地面觀測資料可提升午後的對流預報能力，而加入降水雷達資料與提高雷達資料更新頻率，皆可更進一步提升模式預報效益。

為了持續進一步提升及短期定量降水的預報效能，本研究藉由提高模式解析度(由2公里提高為1.5公里)及更換模式邊界條來源(由全球降尺度10公里預報系統調整為區域模式3公里預報系統)，來評估其對於降水預報效能的影響，以作為後續預報系統作業更新的參考。

關鍵字：雷達資料同化、快速循環更新、定量降雨預報

Abstract

In order to improve the numerical prediction capability for short spurts of heavy rainfall systems, high-resolution model and advanced numerical forecasting systems are indispensable. How to formulate an appropriate data assimilation strategy that combines the observation data with data assimilation system to provide high-frequency short-term quantitative precipitation forecast (QPF) is an important issue.

Taiwan has a high-density radar and surface observation network, which not only can provide scientific research, weather monitoring and disaster warning of the heavy precipitation system, but also provide to NWP model to improve short-term QPF. The CWB operational mesoscale and convective-scale data assimilation systems already showed that combining radar and surface data can improve the ability of afternoon convection forecasting. Adding precipitation radar data and increasing the time frequency in radar data assimilation can will enhance the model prediction capabilities.

The current study foci on evaluating the impact of increasing model horizontal resolution (from 2 kilometers to 1.5 kilometers) and replacing boundary conditions (from the global downscaling 10 km forecast system as the CWB's regional 3 km model) on enhancing the convective-scale forecast capability.

Key word: radar data assimilation、Rapid refresh cycle、quantitative precipitation forecast