



Development and Verification of Radar-Satellite Blended QPF (Quantitative Precipitation Forecast) for heavy rainfall

Sangmin Jang, Sunkwon Yoon, and Kyungwon Park

APEC Climate Center, Busan, Korea, Republic Of (smjang@apcc21.org)

Due to the recent extreme weather and climate change, a frequency and intensity of localized heavy rainfall increases and it may bring various hazards including sediment-related disasters, flooding and inundation. To avoid and mitigate damage from such disasters, very short range forecasting and nowcasting of rainfall are very important. Generally, extrapolation is the best method of precipitation forecasting using radar rainfall data within a few hours from the present. However, there is a need for improvement due to QPE (Quantitative Precipitation Estimate) using radar being less accurate than gauge on surface. To improve QPE and to take advantage of the COMS (Communication, Ocean and Meteorological Satellite) data, a technique to blend radar with satellite for very short range forecasting purposes was developed in the present study. The motion vector of precipitation systems are estimated using 1.5km CAPPI (Constant Altitude Plan Position Indicator) reflectivity by pattern matching method, which indicates the systems' direction and speed of movement and blended radar-COMS rain field is used for initial data. The accuracies of rainfall forecasting data were verified utilizing AWS (Automatic Weather System) data for extreme rainfall occurred by heavy rainfall and typhoon Chaba in the southern part of Korean Peninsula on 25 August 2014 and 5 October 2016. QPF by combining radar and COMS has an acceptable performance in 60 mm/h or more of the strong heavy rainfall. The results in verification showed that forecasts are useful in spatial distribution, rainrate, and accuracy, but more work is needed in the case studies and qualitative assessment.

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