

## **Analysis of radar rainfall estimation accuracy using Hybrid Scan Reflectivity (HSR) Technique in Korea**

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The role of weather radar with high spatial and temporal resolution is increased to observe and forecast the meteorological disaster. However, due to the nature of weather radar, limited observation area is occurred by the ground clutter beam-blocking. Therefore, this study utilized the HSR (Hybrid Scan Reflectivity) technique to estimate rainfall in order to improve the bias of rainfall estimation due to the radar beam-blocking.

In this study, the HSR technique is carried out as follows; First, generate the HSR (beam-blocking) mask (beam-blocking ratio  $\geq 90$  %, ground clutter ratio  $\geq 20$  dBZ) using the radar variables. Second, alter a radar elevation using a Fuzzy QF (Quality Factor) ( $QF \leq 0.5$ ). Third, rearrange bin and ray values of the HSR mask to match with data format of all weather radar. Forth, generate the HSR reflectivity map using a HSR mask. Finally, estimate the rainfall ( $Z=300R^{1.4}$ ) using the HSR reflectivity map. As a result in the case analysis of the summer season (from June 2012 to August 2012), In comparison with the existed QPE (Quantitative Precipitation Estimation) model in Korea Meteorological Administration, RMSE of the HSR rainfall estimation is improved as 19 %. Although, in non-beam-blocking area, the accuracy of rainfall estimation with the HSR technique is improve about 10 % (in RMSE), in the beam-blocking area, results of the HSR technique is superior to the existed QPE model about 23 % (in RMSE).

Therefore, the HSR technique enables to improve the accuracy of the quantitative rainfall estimation in the beam-blocking area. Hereafter, this study will apply the HSR technique to the dual-polarization radar to estimate rainfall.