

Evaluation of Dual Polarization Rainfall Estimation Algorithm Applicability in Korea: A Case Study on Biseulsan Radar

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Abstract : Dual polarization radar provides comprehensive information about rainfall by measuring multiple parameters. In Korea, for the rainfall estimation, JPOLE and CSU-HIDRO algorithms are generally used. This study evaluated the local applicability of JPOLE and CSU-HIDRO algorithms in Korea by using the observed rainfall data collected on August, 2014 by the Biseulsan dual polarization radar data and KMA AWS. A total of 11,372 pairs of radar-ground rain rate data were classified according to thresholds of synthetic algorithms into suitable and unsuitable data. Then, evaluation criteria were derived by comparing radar rain rate and ground rain rate, respectively, for entire, suitable, unsuitable data. The results are as follows: (1) The radar rain rate equation including KDP, was found better in the rainfall estimation than the other equations for both JPOLE and CSU-HIDRO algorithms. The thresholds were found to be adequately applied for both algorithms including specific differential phase. (2) The radar rain rate equation including horizontal reflectivity and differential reflectivity were found poor compared to the others. The result was not improved even when only the suitable data were applied. Acknowledgments: This work was supported by the Basic Science Research Program through the National Research Foundation of Korea, funded by the Ministry of Education (NRF-2013R1A1A2011012).

Keywords : CSU-HIDRO algorithm, dual polarization radar, JPOLE algorithm, radar rainfall estimation algorithm

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