Improved small scale QPE in Seoul metropolitan area by combining X-band and S-band dual-polarimetric radar networks

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X-band radar network can be used to improve the radar quantitative precipitation estimation (QPE) at small urban area or mountainous areas with high spatial and temporal resolution that are relevant to the hydrological responses at these areas. On the other hand, the X-band radar network can suffer with partial beam blocking as well as total loss of power by path attenuation depending on the density of radars and their deployment. In this study, we build up a X-band dual-polarimetric radar network to improve the accuracy of precipitation field and thus better prediction of hydrological response. The high resolution (1min in time and 100m in space) radar QPE is achieved by first optimal estimate of X-band radar QPE for individual radar with multi-angle hybrid radar map updated every 1 min.. Then, individual radar QPEs are merged to generate radar QPE composite of X-band radar network that is subsequently blended with S-band radar composite. We will summarize the new method of radar QPE, systematic evaluation, and its application into urban hydrology over Seoul metropolitan area.

Acknowledgment

This study was funded by the Korea Environmental Industry & Technology Institute (KEITI) of the Korea Ministry of Environment (MOE) as “Advanced Water Management Research Program” . (79615)

Keywords: small scale QPE, urban, X-band, S-band, Multi-angle hybrid radar map
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