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The new approach of polarimetric attenuation correction for improving radar quantitative precipitation estimation(QPE)

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To obtain high-quality radar quantitative precipitation estimation data, reliable radar calibration and efficient attenuation correction are very important. Because microwave radiation at shorter wavelength experiences strong attenuation in precipitation, accounting for this attenuation is the essential work at shorter wavelength radar.
In this study, the performance of different attenuation/differential attenuation correction schemes at C band is tested for two strong rain events which occurred in central Oklahoma. And also, a new attenuation correction scheme (combination of self-consistency and hot-spot concept methodology) that separates relative contributions of strong convective cells and the rest of the storm to the path-integrated total and differential attenuation is among the algorithms explored. A quantitative use of weather radar measurement such as rainfall estimation relies on the reliable attenuation correction. We examined the impact of attenuation correction on estimates of rainfall in heavy rain events by using cross-checking with S-band radar measurements which are much less affected by attenuation and compared the storm rain totals obtained from the corrected Z and KDP and rain gages in these cases.
This new approach can be utilized at shorter wavelength radars efficiently. Therefore, it is very useful to Weather Radar Center of Korea Meteorological Administration preparing X-band research dual Pol radar network.