

Interactive comment on “An empirical QPE method based on polarimetric variable adjustments” by Jungsoo Yoon et al.

Anonymous Referee #2

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This paper proposes an empirical calibration of radar polarimetric variables for quantitative precipitation estimation (QPE) in Korea. Relation between polarimetric moments are obtained from disdrometer measurements. Several QPE retrievals are applied from the radar observations. The benefit of using dual polarized X-band radar data is proved useful compared to standard reflectivity-to-rainfall based algorithm estimator.

The research area of using radar data to obtain good quality distributed rain estimations recovers a real need for hydrological applications (flash-floods monitoring) and is still opened. Although the paper is structured and the objectives appear clearly, the methodology, results and operational implication should be better described.

1- Several challenges affect radar QPE besides calibration of radar moments: ground clutter, beam blockage in complex terrain, vertical structure of precipitation, partial

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beam filling. . . A discussion of these issues and how they are handled in the present study is required.

2- The methodology is not clear on how the adjustment of radar moments is performed and what constraints are used.

3- Are the ground measurements from one disdrometer used to derive relations between polarimetric variables representative spatially and temporally (only one summer used)? Could we expect any variations in disdrometer-derived relations according to the precipitation microphysics associated with different seasons or rain types (convective, stratiform) for example?

4- How are these disdrometer-derived relations affected by the large resolution difference between the disdrometer and the radar observations?

5- Comparison of radar estimates with raingauge measurements provides indication of the pertinence of the different processing techniques employed. However the evaluation is not well developed, for example classical criteria are not used (e.g. bias, correlation, root mean square error). The abstract mentions an improvement but only a number is provided without details on the score used to assess this improvement.

6- There is no mention of the sampling difference between radar and raingauges. For comparison it would be useful to give some elements about the spatial representativity of raingauges measurements at the considered time step, and how they match the QPE spatial resolution.

7- Regarding the raingauge data, is data control performed?

8- A discussion on the operational applicability of this method would be welcome.

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