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Hydrology and Earth System Sciences Discussions

Interactive comment on "Improving the rainfall rate estimation in the midstream of the Heihe River Basin using rain drop size distribution" *by* G. Zhao et al.

Anonymous Referee #2

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In this paper, four relationships of estimating rain rate (R) and radar parameters(Z, Kdp, Zdr etc.) measured from polarization radar are established based on the raindrop size distribution data observed by Parsivel disdrometer in Qinghai-Tibet plateau area. The comparative study shows that the relation of type R(Kdp,Z,Zdr) is the best and the R(Z) is the worst. It is reasonable and useful for improving the accuracy of estimation rainfall rate from meteorological radar. Also, the DVD data given in this area is very important for understanding the microphysical characteristics of precipitating cloud in this plateau-area due to the lack of related observed data.

Since estimation rain rate from meteorological radar is a strong application topic, to evaluate an algorithm should put it on the real operation environment, in this paper the comparison result only based on DVD simulation are not enough. To do the validation with in-situ surface rain-rate and radar observation for the four type relationships is recommended. It should be pointed out, when using X-band radar data, the attenuation have to be corrected firstly.

In addition, some commends are as follow: 1. Do some comparison study of the DVD between plateau area and other areas, it will be helpful for understanding the microphysical characteristics of precipitating clouds in Qinghai-Tibet plateau area; 2. Please give the DSD data (total 1074 samples) for different precipitating cloud type, at least for convective and stratified precipitating cloud respectively; 3. Fig. 1 should give the error bar, not only the average values are given; 4. " 4 types estimator" better instead of "4 relationships of rain-rate and radar parameters".

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 6107, 2009.