

Interactive comment on “Approaches to radar reflectivity bias correction to improve rainfall estimation in Korea” by C.-H. You et al.

Anonymous Referee #1

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The following is a review of amt-2015-392

Primary comment: It is understood that the authors desire the best calibration possible for a single polarizarion radar (SPOL) using dual-polarimetric radar (DPOL) as a guide. In the opinion of this reviewer, the authors do not describe the 3 calibration methodologies clearly, and do not describe the meteorological events and data clearly. The authors draw conclusions as to which methodology is best based on statistics generated from a fixed ZR relationship. This approach is very misleading as a fixed ZR relationship may only be valid for a limited time/area within the event. Figure 16 shows noticeable differences in the RMSE statistics between the two events, yet the authors do not describe why. I suspect the differences are due to the underlying meteorological differences between the two events analyzed. By analyzing other events, conclusions drawn by the same methodology may be completely different depending on the degree

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of validity of the fixed ZR.

If the authors wish to revise this paper, I respectfully suggest that the focus be on the three calibration techniques, and not on matching rain gauge data. There is not enough description of the calibration methods to fully understand what the authors are actually doing. In section 2.3, the authors state that the light rain threshold of $20 \text{ dBZ} \leq Z \leq 28 \text{ dBZ}$ was used in Ryzhkov et al 2005 and Marks et al 2011 for self-consistency calibration – this is not correct. By using such light rain, the Kdp values will not be high enough for reliable self-consistency results. No description of the self-consistency equation is provided - what equation was used, and how was it derived? There is not an adequate description of the Zdr calibration. There is no explanation as to how reflectivity values between SPOL and DPOL are actually compared.

Figure captions are not well described (i.e. fig 9 and 10), and lead to confusion of the reader. Large fluctuations in the reflectivity differences are not described (other than by decreased sample numbers).

Authors are basing conclusions on rain gauge rates, yet little-to-no information is provided on the gauge network. What type of rain gauges? Given that rain gauges are an accumulation instrument, how are rain rates computed.....via interpolation as in Wang et al 2008, or some other method?

Correcting radar calibration will improve comparisons with ground "truth" instruments. This is nothing new to the research community. If the authors wish to move forward with this paper, I respectfully suggest that the emphasis be placed on the actual calibration techniques, and not focus on potentially misleading results from a fixed ZR relationship.

Suggested disposition: Major revisions or rejection in current form.

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2015-392, 2016.

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