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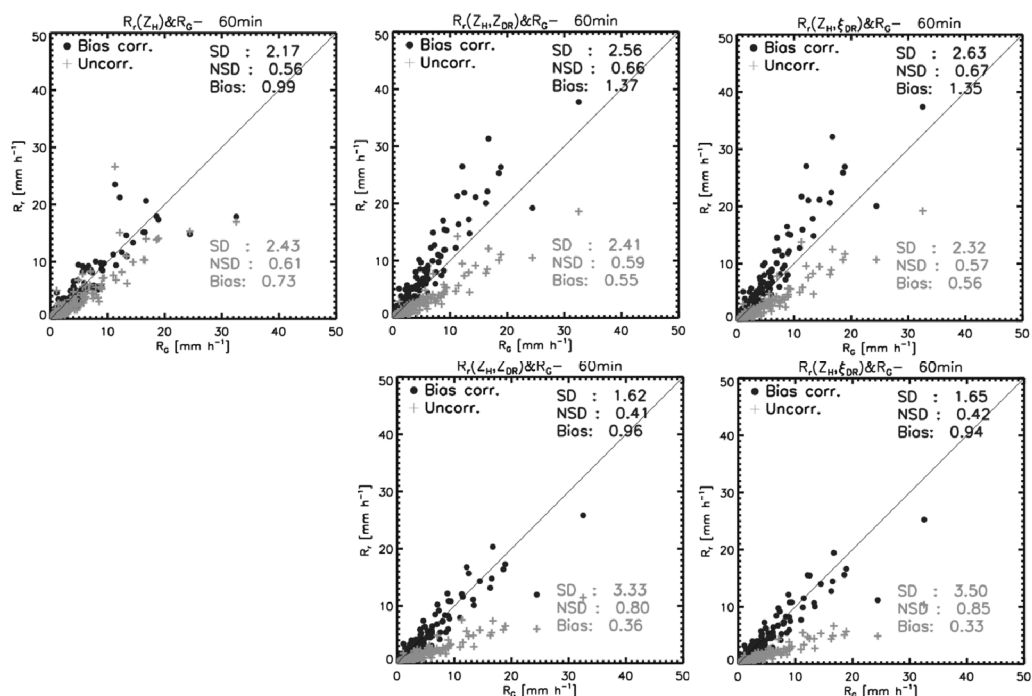https://doi.org/10.2151/jmsj.2015-005

Figure 1. Scatterplot of radar rainfall rate R_r (2 km^2) vs. gage rainfall rate R_G (2 km^2) by applying adaptive calibration biases. The upper panel is for the rainfall estimators derived from disdrometer and bottom panels are for the adjusted relationship.

- The calibration biases of Z_H are calculated by using the self-consistency constraint between Z_H and specific differential phase shift (K_{DP}). This procedure is performed every 2.5 min. The biases are varied from -3.3 dB to 0.8 dB during the period between July 2010 to October 2011

- The Z_{DR} calibration biases are obtained by two methods: 1) vertically pointing measurements, and 2) comparison of observed data with the average Z_H-Z_{DR} relationship derived from disdrometric data. The Z_{DR} biases are varied from 0.25 dB to 0.7 dB and both methods show similar results. This Z_H-Z_{DR} technique can be applied for a volume scan and does not require a special scan.

- The verification of rainfall estimation is performed by applying 1) average Z_H and Z_{DR} calibration biases for the entire period, and 2) adaptive calibration biases that vary each rain event. The application of adaptive calibration biases is more effective for R(Z_H,Z_{DR}) and R(Z_H, ξ_{DR}) than for R(Z_H), indicating necessity of frequent calibration of Z_H and Z_{DR}. (Fig. 1).