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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.

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In my review I noted that there are several discrepancies and errors in the figures in the manuscript, but I only mention one of these errors. The other discrepancies are discussed in this comment.

The scatter plots related to rainfall intensity R (mm h^{-1}) for stratiform rain, Figures 3a, 5a, and 7 (all panels), seem to contain different sets of observations. I had assumed from the text in the paper that all of these figures are made with the same disdrometer dataset. However, when comparing the maximum rainfall intensities of these different

scatter plots, I get approximately 10 mm h^{-1}, 3.5 mm h^{-1}, 2.6 mm h^{-1}, 2.1 mm h^{-1}, 2.85 mm h^{-1}, and 2.85 mm h^{-1} for Figures 3a, 5a, 7a, 7b, 7c, and 7d, respectively. The same holds for the scatter plots related to rainfall intensity for convective rain, where the maximum values are approximately 30 mm h^{-1}, 15 mm h^{-1}, 15.5 mm h^{-1}, 12 mm h^{-1}, 12 mm h^{-1}, and 15.5 mm h^{-1} for Figures 3b, 5b, 8a, 8b, 8c, and 8d, respectively. And also the scatter plots related to water content M (kg m^{-3}) have these discrepancies. The maximum water contents for stratiform rain are approximately 53 kg m^{-3} and 145 kg m^{-3} in Figures 4a and 6a, respectively. For convective rain this is approximately 2600 kg m^{-3} and 700 kg m^{-3} in Figures 4b and 6b, respectively.

If different data sets have been used for each of these graphs, this should be clearly stated in the manuscript. If this is not the case, there are errors in these graphs. In any case, conclusions drawn based on these graphs should be reconsidered (the comparison should be fair, so the same datasets should be used for all of these graphs).

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