**Atmospheric
Measurement
Techniques
Discussions**

# Interactive comment on "A comparison of rainfall measurements by multiple instruments" by X. C. Liu et al.

**Anonymous Referee #1**

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This paper compares rainfall measurements from three different types of rain gages, a weather detector, and two different disdrometers. Many events over a period of ten months have been used in this study. DSD parameters are also compared between the two disdrometers, i.e. JWD and 2DVD.

This is a very useful paper, well written and well presented, well structured, concise, and is certainly suitable for publication in AMTD. There are just a few comments/questions which need further clarification, as given below:

1) Page 3, line 4: Please add the proper reference for JWD.

2) Page 3, line 15: no space between TRMM

3) Page 7, line 15: 'where' should be 'whereas'

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4) Fig. 2 and Table 1: How is an 'event' defined when (what the authors call) rain amount is determined?

5) Fig. 4(a) and (b): The plots are difficult to interpret; can they be replotted in color to make the curves clearer?

6) Page 9, lines 12-15: This sentence is not at all clear, and needs to be rewritten.

7) Fig. 4 and 5: Are these 1-minute rainfall rates – please specify.

8) Fig. 6: Again, were these determined from 1-minute DSDs – please specify.

9) Fig. 7a-d: it's not clear how many DSDs are used in each R interval case; do they represent the 'averaged' DSDs for a given R interval?

10) Also, regarding the JWD measurements, was dead-time correction applied (because this can alter the estimated DSD parameters)?

11) Rain rate comparisons: much depends on the weighting function used in the comparisons, so justification for equation (3) needs to be elaborated upon. For example, why use dynamic weighting function – what are advantages, etc.

12) For rain rate and DSD parameters comparison, would there be improvements if a running average over 3 minutes is used? If so, by how much.

Publication is recommended, after consideration of the above points.