HESSD

Interactive
comment

Interactive comment on "Comparison of precipitation measurements by Ott Parsivel^2 and Thies LPM optical disdrometers" *by* Marta Angulo-Martínez et al.

Anonymous Referee #1

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This paper discusses a comparison between two the outputs of 4 disdrometers of two different types. The data set is interesting and worth analysing. The topic is relevant for the hydro-meteorologists and could be published in HESS provided that some major modifications are carried out on the manuscript.

General comments:

- Presentation should be improved, notations are not clear and change through the text (as an example the rain rate is referred by three notations R Pr I...), references to figure numbers are often erroneous, methodologies implemented are not properly described.

- Not all figures are properly discussed within the manuscript. Some results are not

properly justified from figures or tables.

- The authors insists on the differences for small drops. Plots of DSD (N(D)) could be helpful in the discussion.

Detailed comments:

2) Data and methods

- Figure 1 : It seems that there is also a wind sensor, at least for direction. Since all the devices are oriented in the same direction, did you check whether this parameter had an influence on the similarities or discrepancies. Were the devices always oriented this way or part of the experiment was done with devices oriented perpendicularly?

- p.5 l.8 0.005m2, it might be helpful for the reader to express in cm2.

- p.5 l.19 : is the relation between axis-ration and equivolumic diameter the same for both devices ?

- Eq 1 : KE is not defined in the text. I would replace N by a N_{i,j} which makes more visible that it is a number per bins of size and velocity. Provide units for "a" and "Pr". Why not use R for "Pr" ?

- p.7 l.19-20 : I guess that it is pretty minor, but did you check if the given realization of random affectation of a diameter within a bin had an influence on the results.

- Table 2 : Please define all variables somewhere in the text (KeM, Npm...)

- Section 2.3 : It is quite hard to follow and presentation should be strongly improved. The last paragraph (p.8 l. 24-26) should also be written for non R users.

3) Results

- p.9 l.4-8 : it could be interesting to discuss the number of time steps when Thies records some data and not Parsivel to understand more their sensitivity differences (keeping in mind potential issues already mentioned in the text).

- Table 3 : clarify the the meaning of Nr. The fact that N_records = 26.8% for Parsivel M1 is the greatest one seems in contradiction with the text mentioning a greater sensitivity (or false alarm) for the Thies.

- p. 9 l.22 : the differences between the two parsivels seems very high with regards to other similar studies. Do you have any explanation or interpretation ? I think that this should be mentioned.

- p. 9 l.15-22 : the figures given do not seem to be in agreement with the plot in Fig. 2 (ex $\sim$ 400 mm for Thies in the text and $\sim$ 250-300 on the graph....

- Fig. 3 : it could be interesting to add plot of DSD (N(D)) for the whole events. And discuss them.

- Fig. 4 : did you apply a filter based on discrepancies of velocity with expected velocity for terminal fall velocities formula as some authors do ?

- p. 10 l.13 : please explain more in details what is a kernel plot, it might not be obvious for all the readers.

- p. 10 l. 19 : ref to Fig. 2 is a mistake.

- p.10 l.20-23 : should be mentioned that it is Fig. 6 that is discussed. Discussion should be extended by starting by explaining more precisely what is plotted (the short figure caption is not enough).

- Section 3.3 : It is not clear what you mean and how you show it from the results (not sure that it is Fig. 6 that is discussed).

- section 3.5 : the limited impact of rain rate is somehow surprising since I would have expected the that exceedance smaller drops would affect more strongly small rain rates (for which their influence on the total rainfall amounts is greater).

- Table 6 is not well discussed and quite hard to "digest" for the reader. It should be improved (may be a graphical representation would be more helpful for the reader)

4) Discussion and conclusions

- Should be updated according to improvements

- Some "technical" issues with references (ex p. 13 l22-23)

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