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Interactive comment on "Two months of disdrometer data in the Paris area" *by* Auguste Gires et al.

Anonymous Referee #2

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Summary

This manuscript presents an original data set of raindrop size distribution (DSD), an important piece of information to describe the microstructure of rainfall. The data described in this manuscript come from three optical disdrometers: two Parsivel2 from OTT and a PWS100 from Campbell Scientific. The period of observation cover two winter months in the Paris area in France, with a fair amount of precipitation (between 84 and 104 mm in total depending on the considered disdrometer). In addition to the raw data (size and velocity in a number of classes), the authors give a nice introduction with relevant references, and also provide "derived" quantities like the rain rate for instance, as well as useful tools to browse and visualize the data.

Recommendation

The data set is relatively original in the sense that similar data sets (in temperate mid-latitude regions) have been collected and made available to the community, but not with this specific configuration of three collocated instruments among which one of a different type. The fact that these three instruments are collocated, hence making possible the assumption that they sample the same population of raindrops, is attractive to quantify the sampling uncertainties associated to the measurements. The only limitation I see is the rather limited duration of the period of observation: two months is short, and it will be difficult in many related analyses to distinguish peculiar effects due to this short period from more general behaviors. I also have a few minor corrections/suggestions listed below. Overall, I think this is a relevant data set worth to be shared with the community (as is done through the zenodo repository listed in the manuscript). I leave it up to the Editor to decide whether this data set, given its short temporal coverage for rainfall, is worth publication in ESSD or not. I provide in any case a list of relatively minor comments and questions below.

Specific comments

1. P.2, l.5: it should be mentioned that assumptions or external information about the scattering properties must be used to derive radar variables from DSD measurements.
2. P.2, l.14: the need for appropriate parameterizations of the DSD in numerical atmospheric models could also be mentioned as an important application of DSD measurements.
3. P.3, l.14: matrixes should be matrices.

4. P.3, l.16: multiplying by 10/9 to compensate for the "gap" in the measurements implies the assumption of homogeneity, this should be mentioned.

5. P.3, l.17: made instead of maide.

6. P.3, Eq.(1): I am not sure about the units to be used in this equation. If S_{eff} is expressed in cm^2 as suggested in the paragraph below, then there might be an error in Eq.(1). I think it u 6π rather than$\pi/6$ (or 600π if S_{eff} is in mm^2). The authors should check...

7. P.3, Eq.(2): v_i is not defined...

8. P.4, l.3: so it user are: rephrase.

9. P.4, l.16: is it 0.1 mm? If so, the authors should add 0 to make it clear.

10. P.4, l.22: the measured amount over the same period of time at the MeteoFrance site would also be relevant to complement the climatological value (that shows that this period is not too specific, at least in terms of rainfall amount over two months...).

11. P.4, end of Section 2.3: in my opinion, some important aspects are not mentioned: in January and February, solid precipitation can occur, was it the case? To this respect, the temperature observations are crucial, but there is a large discrepancy between the two types of instruments (around 3 deg C in the example in in Figure 4, nicely illustrating its importance: according to the Parsivel, it may snow at the end of the day, while it would only be rain according to the PWS100...); The instruments seem to be close to the edge of the roof, raising concerns about turbulence and wakes; what is the direction of the dominant wind at this site? How does it align with the respective orientation of each disdrometer? These are important aspects to clarify to better assess the quality of the data and the possible applications.

12. P.7, l.7: how are treated the possible zeroes when integrating the DSD in time?

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