

# ***Interactive comment on “Disdrometer measurements under Sense-City rainfall simulator” by Auguste Gires et al.***

**Anonymous Referee #2**

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Data presented here are in principle a relevant contribution to the field of hydrometeorology. To my knowledge, databases of disdrometer measurements in a simulated rainfall environment are not yet available to the scientific community and thus such datasets would be a relevant contribution. In my opinion, the authors must address a few important and major concerns / clarifications about the rainfall simulator itself before to consider the manuscript for further review.

## Major comments

Disdrometer data of simulated rainfall, as said, are extremely interesting. What I could not find in the manuscript is convincing explanation that the rainfall simulator is actually able to “manufacture” rain with a believable microstructure (i.e., DSD).

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1) Section 2.1 and 2.2: while browsing the citations and websites mentioned in those two sections, I could find plenty of information about the disdrometers, while no information about the rainfall simulator design and performance. If such information is available, I recommend to improve those sections and to include as much information as needed. If such information instead is not available, the authors should maybe reconsider whether this manuscript should be re-submitted (and data made available) only after that an evaluation of the plausibility of the simulator measurements is conducted.

2) Page 4, lines 21 -26: this is the type of information that should be expanded or should at least be available in a separate paper. The reader must be convinced about the plausibility of the simulator. Questions that naturally come to mind, and that need a convincing answer, are for example: a) Is it 8 m enough to reach the terminal fall speed and equilibrium conditions of drops? While reading i.e. (Beard, 1976) it seems that the answer is no. Also Fig. 4 in the manuscript shows drop spectra shifted towards lower fall velocity than expected. b) Why is this inclination of the nozzles used?, c) How do the DSD spectra collected compare to the ones observed in “natural” outdoor environments for similar rainfall rates? d) What is the expected use of the data presented in this manuscript, for an interested researcher who access them?

#### Comments

1) Page 2, line 5: Are the two devices here the two disdrometers or the disdrometers and the rainfall simulator?

2) Page 2, lines 6-8: I find it a bit confusing. It seems to imply that information about this set-up is available in other manuscripts, while I could only find information about disdrometer measurements and not about the most important item, i.e. the rainfall simulator.

3) Page2, Line 18: I suggest also (Löffler-Mang & Joss, 2000)

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4) Page 2, line 22: please mention what happens when two or more drops cross the measurement area simultaneously.

5) Page 4, line 24: add schematics of the system.

6) Table 2: add information about rainfall intensity.

7) Section 3: I suggest to provide also NetCDF data files.

Beard, K. V. (1976). Terminal velocity and shape of cloud and precipitation drops aloft. #JAS#, 33, 851-864.

Löffler-Mang, M., & Joss, J. (2000). An optical disdrometer for measuring size and velocity of hydrometeors. #JAOT#, 17, 130-139.

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Interactive comment

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Interactive comment on Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2019-130>, 2019.

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