

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2021-462

Luca G. Lanza (Referee)

Referee comment on "Influence of drop size distribution and kinetic energy in precipitation modelling for laboratory rainfall simulators" by Harris Ramli et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-462-RC2>, 2022

The paper addresses the performance of a designed laboratory rainfall simulator for use in soil erosion and other experiments. Reproducing rainfall characteristics with accuracy in the laboratory is a requisite to support some experimental hydrological studies under rigorously controlled conditions. This would also avoid dealing with the inherent variability of the rainfall process and the many sources of uncertainty affecting any real-world experiment in the field.

In this regard, the topic of this manuscript is relevant and surely of interest within the hydrological sciences, and therefore suited to the journal.

However, the authors first fail to show any improvement of their proposed solution over those already available in the literature, starting from the ones presented in papers that are mentioned among the references of this manuscript. There is no evidence in the manuscript, indeed, that the presented setup performs any better than very similar solutions that already exists.

Second, the proposed setup for the rain simulator is presented in a rather superficial manner, with scarce quantitative indication of the actual performance of the device. It seems that only the number and diameter of the generated drops are measured for validation, while all other parameters (including the fall velocity) are derived from empirical formulations reported in the literature for real rainfall events.

Most important, little effort is presented to demonstrate that the few measured quantities (basically the drop size distribution – DSD – of the generated rainfall) is like the one expected from real rainfall events (at least in the declared range of rainfall intensity generated by the device). Comparison with typical DSD associated with the generated rain intensity values under various meteo-climatic conditions is totally missing.

Finally, the main comments reported in the conclusions do not reflect results of the present manuscript (e.g., no calibration exercise is described in the text, no validation with real rainfall characteristics is provided, etc.). General statements about the dependence of the drop size distribution and the kinetic energy of the raindrops on the rainfall intensity are declared as results of the present study, while obviously they are not.

My knowledge of the English language is rather poor, and I'm not qualified to make a revision of the English used, but my feeling is that the wording and grammar throughout the text should be extensively checked and corrected. Also, the text is quite repetitive in many sections and the presentation should be largely improved

Based on the above considerations, I believe that the manuscript is not ready for publication on HESS, and needs to be largely revised, not only in the presentation of the work but also in its content (first checking the real improvement provided over previously published research) before it can be accepted.

Minor comments are provided in the attached pdf.

Please also note the supplement to this comment:

<https://hess.copernicus.org/preprints/hess-2021-462/hess-2021-462-RC2-supplement.pdf>