

L7: research gap is not clear.

L21-23: it is not clear to me why 'uniform rainfall or ... for such purposes' directly leads to the conclusion 'stochastic simulation of reference rainfall events is necessary'. At least one sentence (to discuss the lack of measurement data ...) is missing.

L23: Does it refer to several types of single-site stochastic rainfall models or space-time models? Event-based simulation or continuous simulation? Please clarify.

L25: This paragraph is describing 'several types of stochastic rainfall models', but I am confused about why a model related to river discharge is described in detail. I get the point that one module in this 'Hydrogram model' is to generate hyetograms. If it is the case, I am wondering whether it is better to directly state that one of those types is the Monte Carlo method instead of the 'Hydrogram model'.

A general comment on this whole paragraph (L38) & Table 1:

The idea of creating this table looks good. However, more references would be needed. The latest one mentioned in this 'literature-based assessment' is in 2004, which is almost 20 years ago. In references for several model types for example in hybrid processes-based models, all references mentioned were published 20 years ago. Although those reference papers mentioned by the authors are very useful, it is necessary to update the reference list.

L38: does it refer to spatial rainfall field or spatially averaged rainfall time series?

L38: Does 'modelling approaches' refers to those modelling approaches for getting a realistic rainfall field for most hydrological applications or specifically for sizing storm-water management infrastructures?

L40: All these characteristics are '... makes the simulations physically relevant/realistic' while 'physically based' is specifically mentioned again in the second criteria 'Physically-based – the simulations rely on physical principles. What's the difference between these two? At least, the meaning of 'simulations rely on physical principles' in the second criteria need to be clarified.

L56: The research gap is not ever mentioned until now. It would be much better to clearly state it in the manuscript.

L57: Single-site or multi-sites or spatial-temporal rainfall field or something else? please clarify.

L59-61: Ok. this seems to be the research aim, which gives me the impression that the authors are implying that: Using any existing stochastic rainfall models, it is NOT possible to "simulate reference rainfall ensembles characterized by P, D, T while exhibiting temporal variability and intermittency close to that of observed rainfall data".

If my impression is correct, the authors were taking this as a research gap. However, this gap was not discussed or mentioned in the introduction section.

I suggest revising the whole section and adding more essential information to it to make this introduction section easier to follow.

L78: resolution (space and time)?

L120: are TM analysis and DTM analysis newly developed in this study? This is not clear to me.

L170: Is scale-symmetry able to be represented by other model types? From Table 1 in this manuscript, at least the Radar-based method can represent this, which can directly give us a space-time field. Why choose the multifractal theory instead of a radar-based method (see Pegram's paper as mentioned by the authors)? It will be helpful to justify the choice and include this discussion (probably in the introduction section).

L172: The authors mention that these types of models can be considered as a bridge between purely statistical and purely physical models. I am wondering whether these features have been in this cascade model used in this study: seasonality (or different types of storm event).

L176: It seems that the study presented here is to simulate temporal rainfall as the author mentioned in the abstract, but 'rainfall fields' convey a message that a time-varying spatial field is generated. Not entirely sure if this word is widely used when time series is generated. If not, please change this word.

L180: Does it always refer to temporal resolution?

L225: Ok, I can see that these metrics might be useful. Besides these, I am wondering whether the autocorrelation of simulated events is well reproduced. This feature plays a critical role in dominating a catchment response to a rainfall event. In addition, since this approach is proposed for hydrological applications, I am wondering whether it is much more convincing to feed those simulated scenarios into a hydrological model (event-based) for better validating this approach?

L280: Has the author developed/improved a novel method in this study. Please clarify it.

Figure 6 and Figure 7: these two figures are not informative. Please consider simplifying/redesigning these or moving them into the appendix.