

Interactive comment on “A Hybrid Stochastic Rainfall Model That Reproduces Rainfall Characteristics at Hourly through Yearly Time Scale” by Jeongha Park et al.

Anonymous Referee #1

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Dear Editors and Authors,

This manuscript documents an approach to improve the Bartlett-Lewis Rectangular Pulse stochastic rainfall model. The authors describe methods to capture the statistical properties of the temporal autocorrelation in rainfall statistics from monthly to hourly time scales.

The Introduction is thorough and contains up-to-date and the leading literature. The Methodology is novel and well described, although there is an opportunity to include a supplement to document the algorithm. The Results are well presented and thoroughly demonstrate the strengths and weaknesses of the approach. The Discussion is

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incorporated into the Results and the Conclusions are succinct and supported by the Results. The figures are all relevant and well prepared. The references are up to date and are all relevant.

The following suggested improvements could be considered: (1) The equation for the relationship between the variance of rainfall at one time scale and another together with the covariances (Equation 1) should be clearly derived from the preceding equation. (2) The comparison of extreme rainfall modeled vs observed was conducted via linear regression. First it is not clear how the "Extreme" observed rainfall points were obtained. Second it is not clear how the modeled values were obtained. Presumably they correspond to similar probability levels obtained from a GEV? In any case the subsequent assessment of bias is reasonable. However it may be more transparent to display the tails of the probability distributions side by side to more clearly visualize how well the model reproduces the observed data. Alternatively, the parameters of the GEV distributions could be compared.

There are only a few minor editorial suggestions (which have been included in a scanned document)

Please also note the supplement to this comment:

<https://www.hydrol-earth-syst-sci-discuss.net/hess-2018-267/hess-2018-267-RC1-supplement.pdf>

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-267>, 2018.

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