The focus of this article is to extend the parameter search domain of the randomized Bartlett-Lewis rectangular pulse model. The authors analytically derived the equation representing the first through the third-order moments of the synthetically generated rainfall when the parameter "alpha" is less than one, which, I believe, is a remarkable mathematical endeavor and contribution in our field of rainfall modeling. I have been working on this topic for the last several years, so I came to develop my own version of the model reading the submitted manuscript and had an opportunity to validate it myself using the same Bochum data. Here is what I found:

(1) The authors argue that when the domain of the parameter alpha is extended such that 0<alpah<1, the extreme values can be better represented. To me, as the parameter alpha becomes smaller, the variability of the parameter eta should be also reduced because:

E(eta) = alpha / nu

Var(eta) = alpha^2/nu

, which subsequently reduce the variability of rain cell intensity in the following manner:

Var(miux) = Var(iota * eta) = iota^2 * Var(eta) = iota^2 * alpha^2/nu

I believe that the extreme value should be associated with the tail part of the distribution of miux, but according to the above equation, the tail of the distribution should be thinner.

Therefore, I argue that the reduced value of alpha should improve the model's fitting ability to rainfall characteristics with "more regular" behavior.

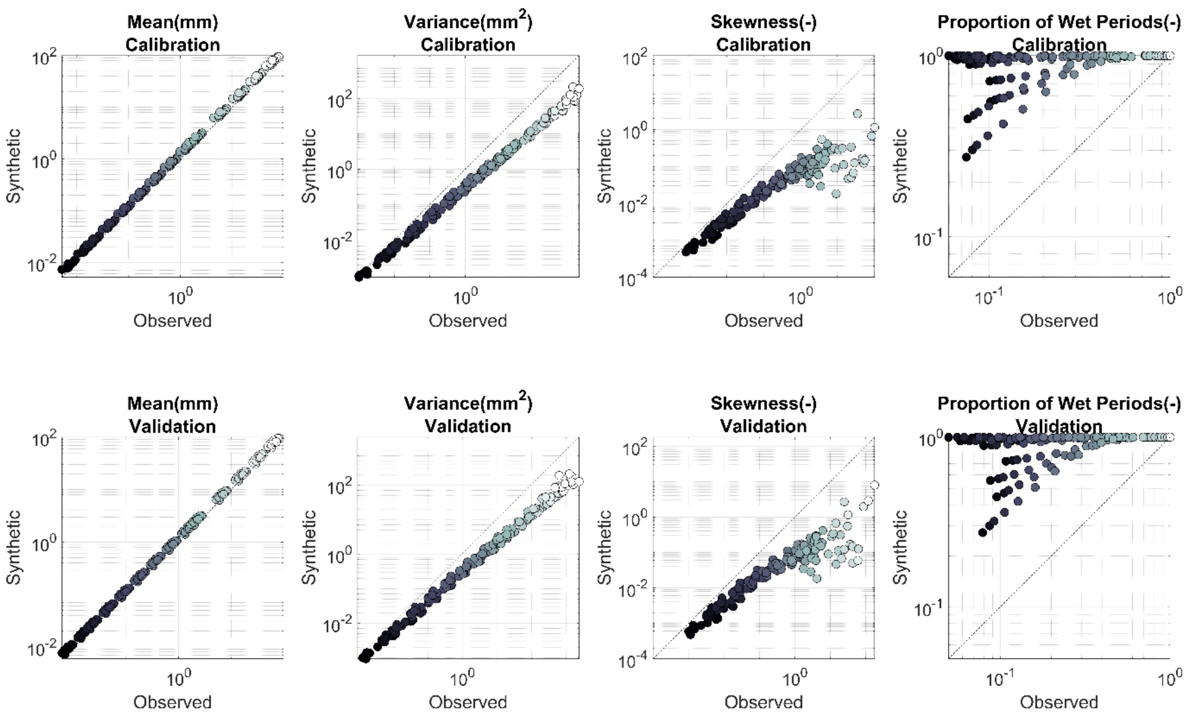
(2) The observed annual maxima shown in Figure 11 and Figure 12 seems to be lower than the actual value. According to my calculation, the observed annual maximum of daily rainfall goes upto 90+ mm while the values shown in the figure goes upto only 70mm. I guess this discrepancy came from the way to estimate the annual maxima. In my case, I ran the moving window of a given aggregation interval throughout the 5-minute timeseries over one year to get the maximum value, while the authors aggregated first and then took the maximum.

(3) The parameter estimation process does not seem to have considered rainfall intermittency (e.g. equations for proportion of dry/wet period). If you put the parameter values of Table 4 for the equation of proportion of dry period, the value is almost 0, which means it rains all the time. Please see the figure at the last page of this review.

(4) Please specify the unit of the parameters in the tables. Especially, the parameter iota in the paper confused me because the original Bochum data is in the unit of cm and your iota is in the unit of mm.

It may be also beneficial if you add the column of the objective function values in the tables for the reader’s reference.

(4) The parameters with better fit could be estimated. I put the parameter values of Table 4 and validated it myself against the standard statistics, which is shown in the following figure:



I could estimate the better parameter values with the particle swarm optimization algorithm (less underestimation of variance and skewness, and the P0 aligning to 1:1 line). I guess this is because the 6-dimensional objective function has huge multi-modality, so any slope-based optimization method tend to fail to identify the true global minimum.

(5) Regarding the inverse variance weighting scheme (L120-L123), I just have one simple question. Let’s say that we consider the proportion of dry period (P0) in the calibration process. The interannual variability of P0 will be very small because it is one minus small value every year (e.g. 0.998, 0.980, 0.950, etc.). Therefore, it will have very high weight. Let’s say we consider the proportion of wet period (PW) in the calibration process. The interannual variability will be greater than the first case (e.g. 0.002, 0.020, 0.050, etc.). I think this leads to the controversy because we end up with giving different weight to the same physical property. I am just asking your opinion on this because considering P0 in the calibration process with the inverse-weighting scheme will make the optimization algorithm sacrifice the fit of all the remaining statistics to fit the P0 value.

(6) Regarding the block estimation, the mean of the block values are the estimates of the true statistics, which we can get easily, so I think the parameter estimation should always be performed

based on the true statistics.