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Comment on hess-2021-278

Anonymous Referee #1

Referee comment on "Maximum Entropy Distribution of Rainfall Intensity and Duration – MEDRID: a method for precipitation temporal downscaling for sediment delivery assessment" by Pedro Henrique Lima Alencar et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-278-RC1>, 2021

I have reviewed the manuscript titled with "Maximum Entropy Distribution of Rainfall Intensity and Duration – MEDRID: a method for precipitation temporal downscaling for sediment delivery assessment" by Pedro Henrique Lima Alencar et al..

In this manuscript, the authors presents a method (MEDRID) for precipitation temporal downscaling, then coupled with the SYPoME model to indirectly assess the MEDRID performance. Even though the results presented in the several catchments indicated that the MEDRID method have a good performance, but the authors should make it clear what the novelty of this study is. In addition, the description of how to couple with the SYPoME model is not clear, which makes a direct application difficult of this method.

I would then suggest rejection of the article with invitation to resubmit. My major comments are described below.

(1) The novelty of the MEDRID method is not clear in this version. The Maximum Entropy Principle (MEP) has been widely used in many fields for the selection of an optimal distribution function. The authors seems just use the MEP to select an optimal distribution function for rainfall intensity and duration, if so, the article obviously lacks innovation. Thus, the authors should classify the novelty of the MEDRID method.

(2) The description of how to calculate the series of the ratio D/H and I30/H is confused. Is D/H and I30/H relative to a rainfall event (may last for several days) or just relative to a daily rainfall (only one day)? Should all non-zero rainfall days be considered?

(3) The application of the D/H distribution, coupled with the SYPoME model, were

described in Sect.2.3. But I did not see relative description of how to use the I_{30}/H distribution for SYPoME model. The reliability should be improved.

(4) The authors indirectly assess the performance of the MEDRID method by comparing the M1 and M2 model. However, it can be found from the Figure 5 that the M2 error is systematically large, why? Does this affect the reliability of the comparison result?