Hydrology and Earth System Sciences Discussions

Interactive comment on "A new method of rainfall temporal downscaling: a case study on sanmenxia station in the Yellow River Basin" *by* G. F. Chen et al.

Anonymous Referee #3

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General comments

This paper develops a new daily rainfall downscaling method to quantify the rainfall process for the Yellow River Basin of China. The subject matter is probably relevant to a significant portion of the readers of HESS. However, as there are some shortcomings regarding the explanation and language (detailed comments are given below), a major revision or a rejection but with an encouragement of resubmission is recommended.

Specific Concerns/Comments

1. First of all, the manuscript should be checked and edited by a native English speaker

before re-submission. I have read the paper with difficulties because of the English writing and frequently I have had to guess the meaning of sentences. In its present form, almost every sentence has one or more grammar errors and/or inappropriate usage of words.

2. Authors only use one or two stations as a case study, which may not be appropriate for two reasons: a) it does not take account into the spatial variation of rainfall over the Yellow River Basin; 2) one method performs well in one station, but could totally unsuitable for another station.

3. The main concerns I have is that the conclusion is not fully supported by the evidences. A few figures show that this new method is "better" than several existing methods, such as random distribution method, normal distribution, proportional method, or sinusoidal distribution. Each of these existing methods has its own advantages and caveats, and could be used for different purposes. Clearly, authors have not investigated these methods in detail, and claimed their method was "better".

4. Another relevant issue is the event chosen for this study. It is not clear for me how the authors chose this event. Is it a long-term "typical" rainfall event for the study region? What is probability? I guess we can have hundreds – if not thousands – different rainfall-process events. The fact that new method simulates this event well could not justify its validation for different scenarios.

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