

***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.**

G. F. Chen et al.

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Dear Sir, Thank you for your comments/suggestions for our manuscript. These comments/ suggestions really help us to increase the scientific quality of our manuscript although they are a little bit sharp. We agree to take into account your comments/suggestions in the revised manuscript submission. Please find below the reply to your comments step by step.

RC: A lot of English errors (I'm not going to list them all here) make the paper hard to follow.

Author Reply: The manuscript will be checked by native English speakers in the following days, most of the errors in the manuscript will be corrected in the revised manuscript.

RC: The explanation of the observation data used for developing the new method is not clear and enough. The improvement based on one station observation cannot represent the whole basin area.

Author Reply: Two kinds of data are used in the paper, daily rainfall data and single rainfall events data. Daily rainfall data: daily rainfall amount of every day from 1970 to 1997. Single rainfall events data series: detail information of each single rainfall events from 1970 to 1997. for rainfall events with small amount, just begin time, end time and rainfall amount are record; for rainfall events with large amount, if the duration is longer than an hour, the resolution is an hour; else if the duration is shorter than an hour, the resolution is the duration of the rainfall event. In the revised manuscript, all the data information will be included. The middle reach of the Yellow River Basin is a typical area of PUB areas, and the Sanmenxia Station is the only station with long enough single rainfall events observation data we can get in this area. So in order to check the new method, two station in the upper reach of the Yellow River Basin, Anningdu Station and Tangnaihai Station are mentioned in this study. Because the data series contain different rainfall types of the middle reach of the Yellow River Basin, the Sanmenxia Station can represent the middle reach of the Yellow River Basin which is an important area of flood source of the Yellow River Basin, although it cannot represent the whole river basin. We will adjust the study area to the middle reach of the Yellow River Basin if it is necessary.

RC: It's not evident that the new method will do better, because authors only validate it with a couple of events.

Author reply: We want to point out that the method is validated with two time series but not two events. One contains all single rainfall events from June 1st to July 30th of

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1970, and the other contains all single rainfall events from Jun. 5th to July 30th of 1996. It was our fault that we did not express clearly in our manuscript and it will be improved in the revised manuscript. The first time series contain a rainfall event with middle large amount and long duration and some rainfall events with small amounts. The second time series contain some rainfall events with large amounts and short duration which lead to high rainfall intensity. So the two time series selected contain almost all types of rainfall events in the middle reach of the Yellow River Basin. So in our opinion, the method can be validated with only the two selected series and it is enough.

We will rewrite our manuscript and improve its quality with more scientific information and reasonable English writing.

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