

## ***Interactive comment on “A Universal Multifractal Approach to Assessment of Spatiotemporal Extreme Precipitation over the Loess Plateau of China” by Jianjun Zhang et al.***

**Anonymous Referee #3**

Received and published: 23 November 2019

This paper suggests a novel approach to assess spatio-temporal extremes of precipitations and implements it over of the Loess Plateau of China. The topic is interesting and relevant for the community. The data used seems of quality. The framework of Universal Multifractals (UM) is appropriate for such an issue. However I would not recommend to publish this paper in its current state, mainly for methodological reasons.

Indeed the methodology developed to determine the EPT(section 2.2) seems to contradict the underlying ideas of a multifractal framework. If I understood well the suggested methodology, it consists in performing UM analysis on the series after removing more and more extremes (replacing them with which values ?). Then the retrieved parame-

C1

ters are analysed and a so called “physically meaningful” threshold determined.

I have trouble understanding the logic behind this choice. Indeed, the interest of UM analysis is to analyse the whole data available and obtain  $K(q)$  and  $c(\gamma)$  which then fully characterize the variability across scales. Removing the extremes will simply degrade the quality of the scaling (hence the reliability of the estimates), bias the analysis, and not improve the knowledge on the studied series. EP should be derived directly from the co-dimension function or scaling moment function obtained on the best data available.  $\gamma_s$  could actually be a good choice, but other could be developed notably to include notion of both intensity and frequency as suggested by the authors.

Since all the following depends on the the indicators obtained from this methodology, I believe that this methodology should either more justified (I may have miss a point) or updated before any further study.

In addition, indication of the quality of the scaling, and scaling curves should be provided to the reader.

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2019-430>, 2019.

C2