Natural Hazards
and Earth System
Sciences

Discussions

Open Access

EGU

Interactive comment on "Bias correction of gauge-based gridded product to improve extreme precipitation analysis in the Yarlung Tsangpo-Brahmaputra River Basin" *by* Xian Luo et al.

Yoann Robin (Referee)

yoann.robin.k@gmail.com

Received and published: 11 December 2019

1   General comments

The paper by Luo X. and al propose to compare the performance of four bias correction methods (Linear Scaling, Local Intensity Scaling, Power transformation and Quantile Mapping) of daily precipitations during 1951-2015 over Yarlung Tsangpo-Brahmaputra River Bassin (YBRB). The data to correct comes from the gridded APHRODITE

dataset, and the reference dataset are sparse observations from meteorological stations.

In the first section the dataset and methods are introduced, but it is not clear what time series is matched between model and observations ? The observations are interpolated ? Aggregated ?

Strangely, the authors can compute the error due to biased correction method between corrected dataset and observations used as reference, but not for extremal indexes. So the final section discussed the influence of bias correction but can not check the quality of the correction itself. Furthermore, a classic way to test of a bias correction is the cross validation step. (cut a least the dataset into calibration and validation period, and swap its), not used here.

In the state of the paper, I can recommend the publication only after majors revisions taking into accounts (at least) of my comments, detailed below.

2   Specific comments

Section 2.2 At the end of this section, you have two dataset, APHRODITE (to correct) and some observations at stations. The stations, considering the Fig. 1 does not match with the grid of APHRODITE, so how do you associate the time series to be correct with the reference time series ? At the end of this section we need to know exactly what is the biased dataset X matched with the observations Y.

Section 2.3

- Related to previous questions, I am not sure to understand exactly whats is Pobs and Paph. For example : Paph is a time series of APHRODITE at a grid point and Pobs is the interpolation of observations to correspond to the grid of APHRODITE ? Or you aggregate all data in your three zones TP; HB and FP ?

- For the quantile mapping, how do you fit the Gamma distribution ? MLE ? Moments ? What is the error of the fit ? (I think the error of quantile mapping comes from also from the error of the Gamma model)

Section 3.2.1 This section is based on the description of Fig. 3, which is not readable, please remove the colormap of topography and increase the size.

Section 3.2.2 to end of section 3 You compare the original and bias corrected dataset. But without reference, how can you assess an improvment or a degradation by the bias correction method ? You can investigate the effect of bias correction, but not the quality of the correction.

C3