

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2022-432

Anonymous Referee #2

Referee comment on "Statistical post-processing of precipitation forecasts using circulation classifications and spatiotemporal deep neural networks" by Tuantuan Zhang et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2022-432-RC2>, 2023

The authors introduced a new statistical post-processing method by incorporating large-scale circulation patterns with local spatiotemporal information, which is valuable for Hydrology and Earth System Sciences. However, it still has some questions and need a revision for publishing.

- (1) Section 3 study area and datasets: The title is the same as section 2. Check the title carefully.
- (2) Section 3.1 SOM model: Equation (1) may be incorrect, please check all equations to make sure all of them are correct.
- (3) Section 3.1 SOM model: How to determine the larger domain (95–135°E, 12–53°N) for circulation classification? What is the impact of watershed in China on circulation classification?
- (4) Section 3.2 CNN-LSTM model: How to consider spatial information in the CNN model? It is not clear.
- (5) Section 3.2 CNN-LSTM model: In data preparation, the authors took summer precipitation as an example for explanation, so it might be better to add "Take summer precipitation as an example" before the sentence "First, each predictor is normalized..."
- (6) Section 3.2 CNN-LSTM model: The authors selected 14 predictors as the input of the CNN-LSTM model and were shown in Figure 2, but it may be better to add a table for 14 predictors with corresponding description.
- (7) Section 5 discussion: The following references may be helpful to discuss the violent rain.

Chen G, Wang W C. Short-Term Precipitation Prediction for Contiguous United States Using Deep Learning[J]. Geophysical Research Letters, 2022, 49(8): e2022GL097904.

Li J, Sharma A, Evans J, et al. Addressing the mischaracterization of extreme rainfall in regional climate model simulations—A synoptic pattern based bias correction approach[J].

Journal of Hydrology, 2018, 556: 901-912.

(8) L218: "Once the four post-processing" should be "once the four post-processing". Please check the manuscript to avoid similar errors.

(9) L307 & L316: "SHAP" should be "WPSH".

(10) L320: Is "can" more accurate than "could"?