

Hydrol. Earth Syst. Sci. Discuss., referee comment RC2
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Comment on hess-2021-432

Anonymous Referee #2

Referee comment on "Quantifying the uncertainty of precipitation forecasting using probabilistic deep learning" by Lei Xu et al., Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2021-432-RC2>, 2022

This study attempts to improve the accuracy of precipitation forecasting by jointly considering multi-source data-model uncertainties in deep learning based modeling framework. A case study conducted in the southern and northern China showed that the developed modeling framework is effective to reduce the uncertainty in precipitation forecasting. In my opinion, this study is valuable and the methodology developed is based on rigorous mathematical formulas that is worthy of recognition. Some of my main comments are listed below¼□

- Line 9-26. It is suggested that some summative results should be added to the Abstract.
- Line 138-159. Adding some key formulas about the TCH algorithm can facilitate the understanding of whole framework.
- Some variables in equations need further explanation, such as the 'I' in Equation (1).
- Line 209. Typographical error. Should be 'estimated'
- Line 349-366. There are many experimental settings. It is suggested to explain them in bullet points, or use a clearer presentation.
- Line 377. In Figure 5, it is recommended to plot the uncertainty estimation results of all datasets for visual comparison.
- Line 402: Add two numbers estimated by Loquercio et al. (2020)'s and Srivastava et al. (2014)'s methods for an intuitive comparison.
- The Results Section lacks some detailed analysis on how the developed method can improve the prediction accuracy.