

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2022-213

Anonymous Referee #2

Referee comment on "Customized deep learning for precipitation bias correction and downscaling" by Fang Wang et al., Geosci. Model Dev. Discuss.,
<https://doi.org/10.5194/gmd-2022-213-RC2>, 2022

In this paper, the author customized a deep learning model to bias correct and downscale hourly precipitation data over the coastal region of the Gulf of Mexico. The study considered six different scenarios with different initial parameters to assess the added value in the model performance reproducing the local features. Data from MERRA2 reanalysis was used as predictor and data from stage IV radar as predictand. The results were assessed using the statistical matrices at different time scales. The findings in this paper are very interesting. In general terms this paper falls within the scope of this journal, the figures and tables are well organized, and the results are properly discussed. However, a few minor comments must be addressed:

Specific comments:

- In the upsemling layers the author used the nearest neighbor interpolation method, this method played a fundamental role in increasing the spatial resolution of the results from the residual blocks, the author needs to justify why he chose this particular interpolation method.
- During the training phase, some scenarios consider atmospheric covariates of precipitation from MERRA as predictors, what about the predictand? Did the author use the same variables from stage IV? Also, it's not clear how the author aggregated those covariates to generate precipitation.
- In the results section, the first subtitle "Overall agreement" should start from 3.1.
- The author could elaborate more on why the 6 scenarios resulted in a low correlation ratio at hourly time scale.
- It is suggested to add the definition of r , β , and \square in the caption of Tables 3 and 4.
- Figures 2 and 3: the unit beside the colorbar is missing, is it (mm/hour)?
- Page 12: "Monthly mean from QDM_BI had a relatively higher..." something is missing in this sentence.