

Atmos. Meas. Tech. Discuss., referee comment RC2
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Comment on amt-2021-411

Anonymous Referee #2

Referee comment on "High-resolution typhoon precipitation integrations using satellite infrared observations and multisource data" by You Zhao et al., Atmos. Meas. Tech. Discuss., <https://doi.org/10.5194/amt-2021-411-RC2>, 2022

The authors compared different machine learning models to integrate data from satellites and in situ observations to estimate precipitation during typhoon landfall. The results are well presented and meaningful. Before the acceptance of this manuscript, the authors should provide more in depth discussions on the difference between QPE results estimated from different models as this is the core of this study.

Specific comments:

The language can be improved to enhance the readability. For instance:

Line 17: "... atmospheric reanalysis (ERA-5) via random forest (RF). The RF method fuses..."

Line 21: "... with correlation coefficients (R) of ~0.75 and probabilities of detection (POD) as large as of 0.98 "

Line 23: "... due to the uncertainties in IMERG retrievals."

Line 24: "... the RF algorithm can well integrate information ..."

Line 43: "the amount of rainfall reaching the ground"

Line 60: the literature review regarding to QPE via machine learning methods is out of date, advancements in recent five past years should be reviewed and dicussed.

Data: the authors stated that they used a set of atmospheric variables from ERA-5 reanalysis as basic inputs to RF other than radiances from satellites. As we know, there is about three month time lag to produce such reanalysis data, so how to adop the proposed method for near real time application? Another issue is related to the generation of atmospheric reanalysis. Satellite and ground observations are often assimilated when generating reanalysis fields, so the QPE learning model could be not properly trained when variables such as total precipitation was used.

Line 170: references are needed to support such claims "... but have litte influence on the prediction results", "Changes in these two parameters have little influence on our modeling results, so we will not discuss the sensitivities of results to the RF parameters". Actually, the model structure plays crucial roles in determining the final learning accuracy, so the statements given above are a bit arbitrary.

Figure 4: as shown, the model with rain gauge measurements used as the predictand had an accuracy lower than that of IMERG, commonly we treat in situ measurements as the ground truth and thus the accuracy from the former should have a nominal higher accuracy. is this due to spatial inconsistency between gridded data and rain gauge data.

Line 227–228 and Figure 5: what are reasons behind different dominant variables in four learning models? Needs to discuss in depth

Figures 6–9: the authors should provide more discussions on the different spatial distribution of QPE results from different models since same predictors were used.