

Authors' Responses to Anonymous Reviewer-3 Concerns and Comments:

We would like, first, to thank the anonymous referee #3 for his/her comments which helped us to improve this manuscript.

It is good to see that the reviewer is in the same boat that the authors are regarding to being in favor of using radar-gauge rainfall products. The methodology discussed in this paper can easily be transferred to and modified for other satellite products even microwave-based rainfall. As the reviewer mentioned, this method will definitely be vital in the coming decade as more microwave-based rainfall estimates come into effect. The authors are also aware and believe that microwave can produce higher accuracy rainfall intensity than what from infrared -based rainfall. Launch of GPM will definitely be a revolution on accuracy of precipitation estimation and forecasting but as the reviewer also knows the time resolution of GPM observations from polar-orbiting sensors is 3 hourly that cannot compete with 15 minutes data from two GOES satellites.

A GOES IR-based rainfall product has been selected for this study due to 1) very high, particularly temporal resolutions of GOES imagery as well as the large number of existing satellite IR-based algorithms. Hence, such techniques are needed at the current time for IR-based products and will be modified for new generation of, particularly microwave-based, precipitation products. In the present study the intention is to demonstrate the application of the developed methodology to high resolution geostationary IR-based QPEs.

Responses to the reviewer's comments are as following:

1) Comment: A map of the study area can be useful for section 2.

Response:

Based on the reviewers comment, the map depicting the study area is included on page 8937 as figure 1.

2) Comment: What is the justification of rain/no-rain threshold of 0.1 mm/hr? Any reference?

Response:

The definition of measurable precipitation for hourly gridded precipitation in the United States differs among different studies. Dai et al. (1999) used a threshold of 0.1 mm/hr. (the reference Dai et al. (1999) is included in the revised manuscript).

3) Comment: Third sentence under section 3.1 (This is under) is too long.

Response:

The mentioned sentence has been decided to be removed from the third paragraph of section 3.1 because, due to consultation with a meteorologist, this assumption is not valid for all storm types.

4) Comment: On page 8925, the range parameter should have units of “km”.

Response:

You are right, the unit was missing. “km” has been included.

5) Comment: On page 8926, 3rd line, “The model is relatively insensitive for a range value of 4 to 7 km”. The figure does not show that.

Response:

Thank you for the note. The statements on P8926 L3-L7 is corrected as: *The model is relatively very sensitive for a range value of 4 to 6.5 km. However, there is a steep gradient change in RMSE for a range value of greater than 6.5 km. the RMSE is relatively flat for range values greater than 6.5 km, which implies the relationship between two rainy pixels located at a distance of more than 6.5 km is insignificant.*

6) Comment: No reference should be given in the conclusions.

Response:

Based on the reviewer’s recommendation, references are avoided in the conclusion part.

7) Comment: Please plot figure 4 in long-log space.

Response:

We prefer to keep the plot as it is because we are looking for any kind of relationship not only a linear one. So, log-log plot cannot help to provide us more information in this regard.

8) Comment: The figures (5-8) are difficult to follow unless it will be printed in color.

Response:

The figures will definitely be printed in color.