# Review of "Does the GPM mission improve the systematic error component in satellite rainfall estimates over TRMM? An evaluation at the pan-India scale" by Beria et al.

## General Comments

Upon reading the revised manuscript by Beria et al., "Does the GPM mission improve the systematic error component in satellite rainfall estimates over TRMM? An evaluation at the pan-India Scale.", I find it to be much improved, with interesting added analysis including rainfall-runoff simulations over a second basin, many of the previously unclear points clarified, and the visualisation of the figures improved. Overall, the manuscript reads well, but I recommend some further minor revisions and/or clarifications of the text and figures below. Additionally, there are still too many figures and tables included in the main manuscript; I have further suggested some figures that should be moved to the supplementary material. While the results are interesting and useful, it would be beneficial to see more discussion of the implications of the results.

## Specific Comments & Corrections

Line 34: Surely also, in addition to / regardless of climate change, flooding in itself is a current threat that this paper is relevant to.

Line 70: TMPA acronym is first expanded at line 181, please expand here at first use

Line 103: this should be updated to "two flood prone basins", in this revision

Line 223-224: Do the authors have a reference for the Thiessen Polygon method?

Line 419-420: Lots of false alarms at very high rainfall thresholds implies that it is not good at capturing the extremes; this could have implications for flood modelling etc. and I expected to see this mentioned in the discussions / conclusions, particularly as the authors go on to complete a rainfall-runoff modelling exercise and find that the peak flows are not captured well. This should be an interesting point to mention.

Lines 477-478: The authors refer to a negative bias showing overprediction - it is not clear if underprediction is really what is meant, as the bias is negative. Please clarify in the text, or check that you have positive biases for overprediction, and negative biases for underprediction, to be consistent with the biases presented earlier in the paper.

Conclusion 7: Looking at the hydrographs, the results with IMERG and TRMM are pretty similar regardless of the calibration, for both basins. Neither are capable of capturing the peak flows, despite the results finding that precipitation is generally improved in IMERG. Could the problem be more due to the hydrological model used (would a different model perhaps result in better prediction of the peaks using either of the rainfall datasets?) rather than the choice between TRMM or IMERG? Or is it the case that the rainfall datasets cannot capture the extreme rainfall? A possible limitation that could be interesting to mention.

Line 536: 'Post forecast data assimilation scheme' - do the authors refer to postprocessing?

Figure 5: From the authors' response, I accept that the contrast may be hard to see using a colour scale with only 1 colour. I still find this figure very hard to interpret. Perhaps it would be possible to use cool colours (blue to pink) for positive correlation, and warm (orange and red) for negative correlation? This would allow the use of more colours to avoid the contrast issue, would allow the basins with negative correlation to stand out further making the plot easier to interpret, and would avoid the use of green and red on the same figure (which it is generally recommended to avoid, due to the % of the population who are colourblind).

Figures 7 & 8: Indeed, I agree with the authors comment regarding the use of two colours, I had not realised this point about the FAR > 0.5. Perhaps the relevance of FAR > 0.5 / POD < 0.5 could be mentioned in table 3.

Figures 9-12: These plots are discussed briefly in the manuscript; while the results are interesting, I don't think the discussion warrants four 4-panel figures. The results presented in section 3.5 are clear without needing to refer to the figures, and I would recommend moving them to the supplementary material.

Figures S1 - S3: The points on these figures should not be joined with a continuous line, as these are not continuous data; this can be difficult to interpret and can be misleading.