

Interactive comment on “Assessment of the Weather Research and Forecasting (WRF) Model for Extreme Rainfall Event Simulations in the Upper Ganga Basin” by Ila Chawla et al.

Anonymous Referee #1

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The authors have used Weather Research and Forecasting model for extreme events over upper Ganga basin and evaluated the simulations. The work is of importance; however, there are certain comments that need to be addressed.

1. I have reservation in stating " However, setting up the WRF model, that simulates extremely heavy rainfall over the ISMR region is still considered as a challenging task..". In my opinion setting up WRF is no longer a challenging task, given multiple works have been reported on the same. However, finding the best physics parameterization option or understanding of the combinations of good parameterization options for different purposes is still an area of research and that needs to come out through the first

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paragraph of introduction.

2. I also have reservation in selecting an extreme event without understanding how does the regional model work for seasonal monsoon rainfall over the region. Do they add value to the simulations by global models? What about the existing literature on evaluation of CORDEX in adding values? Which one is more sensitive, microphysics parameterization or cumulative parametrization. How does WRF perform in different years, dry, wet or normal years? There are multiple works that have been published recently. The authors need to perform a good review of recent literature, identify the gap and define the problem. This is missing in the present version of the manuscript.

3. The authors need to present the evaluation of the regional model at least for one season of monsoon (for all 122 days). We have to make sure that the selected parameterization does not overestimate for all the days and hence performing well for the extreme days. This simulation needs to be performed.

4. Figure 4 is wrongly interpreted. The CORDEX models have the boundary conditions from CMIP5 models that do not have any observed initial condition. Hence, it is not correct to pick up specific dates from the simulations and compare. I think it is better to delete this figure.

5. Similarly Figure 12 also has the same problem if the bias is for those specific days.

6. I would specifically suggest to delete the CORDEX part, as it may not be directly related to the work (if authors want they may pick up the evaluation runs that are forced with reanalysis data, but such simulations may not be available for 2013). They should focus on identifying the added value by regional model in comparison with the reanalysis data that is being used as boundary condition.

7. I am not very sure, if the use of single extreme is sufficient for any conclusion.

8. I also would like to know the role of land surface processes in this extreme event. Some details on the land surface module that has been coupled to WRF, may also be

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useful.

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