

Interactive comment on “Numerical rainfall simulation with different spatial and temporal evenness by using WRF multi-physics ensembles” by Jiyang Tian et al.

Anonymous Referee #2

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This paper describes a study on using WRF to downscale six rainfall events in North China for flood warning purposes. The authors have explored the impacts of different parameterizations on the simulation results. The work has been quite thorough with meticulous details. As WRF is increasingly applied in the natural hazard field, this paper is within the remit of the journal and its content is of interest to the readers. However, there are several issues that should be addressed for the paper to be acceptable.

- 1) please explain why a 6 hour spin-up period is used (e.g., why not 12 hours or other times);
- 2) 'The critical value of C_v is 0.4 and 1.0 for evaluating the rainfall evenness ' Please

explain how they are derived;

3) at fine spatial simulation resolutions (as pointed out by Referee #1), WRF is effectively running at CPM mode (Convection-permitting model) in which the dynamics of atmospheric convection is treated with sufficient accuracy in order to make it viable to switch off convection parameterization. It would be interesting to run your WRF model again without Cumulus parameterization and compare the results with the Cumulus parameterizations.

4) it would be helpful to know if any of the six rainfall events have caused any floods in the two study sites. Please explain which WRF simulations are useful to the flood warning purposes, and which are not (ultimately, this is the main goal of WRF applications). Do different parameterizations make any differences for warning purposes?

5) Language issues: The paper has several typos/grammatical errors. Please go through the whole paper carefully to remove them. For example, ' the precipitation easily cause flood...(causes)', ' ... which is trick for forecasting accurately (tricky)', ' found by a lot of simulation. . . (simulations) ', etc.

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