

Geosci. Model Dev. Discuss., referee comment RC1  
<https://doi.org/10.5194/gmd-2021-143-RC1>, 2021  
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## Comment on gmd-2021-143

Anonymous Referee #1

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Referee comment on "A micro-genetic algorithm (GA v1.7.1a) for combinatorial optimization of physics parameterizations in the Weather Research and Forecasting model (v4.0.3) for quantitative precipitation forecast in Korea" by Sojung Park and Seon K. Park, Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2021-143-RC1>, 2021

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The paper "A micro-genetic algorithm for combinatorial optimization of physics parameterizations in Weather Research and Forecasting model for quantitative precipitation forecast in Korea", by S. Park and S. K. Park, analyzes the importance of optimizing the selection of the parameterization physics schemes, and their parameters, in improving the prediction of extreme rainfall at the mesoscale in Korea.

The paper is generally well written and carefully describes the performed experiments. The paper appears scientifically sound and the degree of novelty is high. However there are some small points to be improved before publication, in my opinion.

i) The paper is based on the comparison between several simulations performed with optimized WRF and a single meteorological event. However, the event is only shortly described (section 4.1). There are two reference: KMA (2018) shows a page in Korean in which, for a foreigner, is not easy to understand (and in any case does not contain a meteorological description of the event). Park and Park (2020) is another paper. In my opinion, a paper should be self-consistent and contain all indication to understand the problem; reference to other papers could be used only for details. For instance, Sokcho was the location showing the largest precipitation? During the 27 hours of rainfall there, there were some time periods in which rainfall was more intense?

ii) Maps in figures 5 and 8 show the precipitation in the second domain for all simulations. Since the portion of Korean territory (and adjacent sea) interested by the event is much smaller than the domain, I suggest to zoom on the portion of territory interested by the rainfall (about a quarter of the domain), in order to highlight the details. The other part of the territory is not important in this sense, since there was no any precipitation. In this way, it could be possible to better appreciate the structure of the precipitation area.

iii) it is very clear that this result appears quite interesting, since it shows the importance of using an accurate choice of the physics parameterizations schemes. However, this result could be dependent on the case study. In this sense, if possible, it could be interesting for the reader to add, in the discussions, a sentence in which there is an attempt to understand why some schemes perform better than others, from a physical point of view.

Language: I am not a native speaker, so my opinion on the language, very good, could be biased. There are some minor typos to be corrected (e.g .: gird -> grid, Ninno -> Niño).