

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC2
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Comment on nhess-2020-376

Anonymous Referee #2

Referee comment on "Sensitivity of the Weather Research and Forecasting (WRF) model to downscaling extreme events over Northern Tunisia" by Saoussen Dhib et al., Nat. Hazards Earth Syst. Sci. Discuss., <https://doi.org/10.5194/nhess-2020-376-RC2>, 2021

This work presents a sensitivity analysis to the modification of the cumulus and boundary layer parameterizations in WRF in extreme precipitation events. The objective of this study seems to be focused on obtaining a better prediction of extreme events in the study area based on an optimal ensemble.

Although the underlying idea of the work is interesting, the structure of the work, the exposition of the methodology and the discussion of the results is poor. The objectives of the work are not clearly established, and the low quality writing makes very difficult to find a storyline. In general, the article is written in a fuzzy and lazy way. This makes very difficult to follow it and understand the message that the authors try to send. For all these reasons, I cannot recommend this paper for publication.

The authors should rewrite the article again, trying to give it a rational structure, a more complete and rational exposition of the configuration of the experiments carried out, and a more detailed and clarifying analysis of the results.

Below I list as an example some of the points on which I base my review

I-15. latitude should be location

I-22. "What schemes?"

-After line 58. What are your objectives? What do you can provide as new knowledge?

I-63. In situ data....Observations??

I-68. spatial resolution?

I-72,94. Where do you interpolate precipitation data? Some information about the mesh must be provided.

I-94. Why interpolate data?? In fact, the results of the crossvalidation show not very good results.

I-112 are these the variables you use to build initial and boundary conditions. This has no sense.

I- 119. (Figure 4) What domain is that? How many domains do you use? Which resolution?

** Here, a complete model configuration should be exposed (radiation, LSM, etc), as well as spatial configuration (vertical levels, soil ... etc) In addition how simulations were done (simulated time, spin-up period,

I-125 The description of Cumulus schemes is not useful at all. If authors try to explain something they have to classify the schemes used, for example if they are or not flux mass schemes, trigger mechanism . etc.

-134 The same as before

- About the metrics.. It is really necessary to use all these metrics? Each metric focus on different aspects of the skill. What is the sense of use a metric that is sum of all?

I-244 You inverse the metric (X) ... what do you mean?? $1/X$???

**Some more comments.

-Figure captions should be improved. All information needed to interpret the figures must be in the caption.

- You don't argue why the selection of these 4 cases. I do not understand why undetected events by satellite are candidates for the case selection.

- Figures 8, 9, 10, 11. why they have different styles??