

Nat. Hazards Earth Syst. Sci. Discuss., referee comment RC1  
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## **Comment on nhess-2020-376**

Anonymous Referee #1

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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-RC1>, 2021

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Title: Sensitivity of the Weather Research and Forecasting model (WRF) to downscaling extreme events over Northern Tunisia  
Authors: Saoussen Dhib, Víctor Homar, Zoubeida Bargaoui, Mariadelmar Vich

The aim of this study is to examine the sensitivity of WRF rainfall estimates for different Planetary Boundary Layer (PBL) and Cumulus Physics (Cu) schemes. Sensitivity studies have shown that there is no best common combination scheme (PBL and Cu) for all events. The average of the 10 best combinations for each event is used to map the ensemble. The authors conclude that some schemes are more sensitive and others less sensitive.

The abstract lacks important information. A few sentences about the setup, time simulation, and significant results are desirable. Provide the readers with this information here so they can decide if the paper is useful to their needs and so they can determine where to find the information they need within the main text.

The introduction also lacks the study purpose. In addition, the scientific contributions are not clear in the current form of the manuscript and should be further elaborated. What the gap will be filled?

From the description of the methods given, it is not clear what advancements have been made over other designs already described in the literature. Has there been any previous research using this method? What are the superior methods used in this study?

The results from the study are scientifically interesting and may represent a good examination to get the benefits of processing the entire simulations processes. However, there are several important concerns with the manuscript, such as the presence of a large number of vague descriptions, questionable arguments, and the lack of in-depth discussions. To resolve the fundamental flaws, an essential re-work on discussions is believed to be required, and the resultant manuscript would be so different from this one that it would be considered a new piece of research work.

The conclusion does not have significant finding according to the important results. Which scheme should be recommendation by authors?

Line 32: Please check the correct format of abbreviation! It should be ...blab la bla (MSG MPE) ...

Line 68: ... Radar Topography Mission (SRTM)... Is this correct abbreviation?

Line 73: What is mean 'Heavy event'? Please elaborated it!

Line 78: Why the authors select 2 stations? Where is this location? Please explain it more clearly!

Figure 4 is not clear information! The authors employ both outer and inner domains, where is the boundaries? Give the clear information in your figure!

Line 159: It is difficult to understand this sentence.

Line 162 – 164: Please give the clear explanation for quantile quantile comparison?

Line 173: Why the authors are choosing a threshold of 0.1 mm? What is the reason?

Line 182: The blank space should be removed!