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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Typhoon rainstorm simulation with radar data assimilation in southeast coast of China" *by* Jiyang Tian et al.

Anonymous Referee #1

Received and published: 21 July 2020

This study aims to improve the initial and lateral boundary conditions of the Numerical Weather Prediction (NWP) systems by assimilating Weather radar observations. Nine assimilation modes are designed by three kinds of radar data and three assimilation time intervals. The goal is noble to find the best option of the data assimilation mode for typhoon rainstorm simulations. The paper is well structured and understandable. However, the novelty of the work is still need to be highlighted. English usage in current manuscript should be improved for good readability. Further improvements and clarifications are needed before the paper is acceptable. Detailed comments are listed below:

Major comments: 1. Line 11, Page 5: Eq. (8), the RMSE is expressed as percentage? The numerator part is the RMSE and I think the equation is wrong. Please check as

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Discussion paper

well as Table * and *.

2. Why do you use FNL to drive the WRF model? Would using data from other centers like ECMWF change your final conclusion? As analysis data, FNL has also assimilated data, why do you not use GFS?

3. The rainfall is influenced by typhoon storms. Comparing the realistic typhoon path with the simulations can help to prove the accuracy of the assimilation results. Please add description and figures for the typhoon path simulations.

4. The results are encouraging that shortening the assimilation time interval can improve the rainfall simulations in most cases. How about half an hour or just 6 minutes? I suggest the authors do more work in further study. The research prospects can added in section 5 Discussion.

Minor comments:

1. Abstract, the 'radial velocity' is repetition

2. Plots showing the orography and the location of rain gauges would be desirable. You can add the information in Fig.2.

3. It would be helpful to summarize all physical parameterizations in a table.

4. Please provide references for the two evaluation statistics, CSI and RMSE.

5. Line 24, Page 5: km2 should be km2. Please correct.

6. Line 16, Page 10: add references for these data assimilation model.

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