Geoscientific
Model Development
Discussions

Interactive comment on "Sensitivity of the WRF model to PBL parametrizations and nesting techniques: evaluation of surface wind over complex terrain" *by* J. J. Gómez-Navarro et al.

Anonymous Referee #2

Received and published: 15 September 2015

The authors analyze the influence of different WRF settings in the wind simulation over complex terrain during wind storms. This kind of sensitivity experiments have not extensively applied to the simulation of extreme winds. I can see the value of the contents of the article in this direction. More specifically, I find the article informative and useful to 1) optimize the model performance and 2) guide model developments during these extreme conditions.

My main concern is related to the analysis of the role of the horizontal resolution. The interaction of the domains seem to be two-way which does not provide a clean comparison of the simulations at different horizontal resolutions. This needs to be addressed before the manuscript could be accepted for publication.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

More specific comments are provided below.

SPECIFIC COMMENTS

1. Page 5445, line 11. Are you activating the Jimenez and Dudhia scheme in all the domains? Note that the scheme also accounts for the speed up of the wind over hills and mountain tops.

2. Page 5455, Section 4.3 The role of horizontal resolution. It is pointed out in the model set up (Section 3.1) and in the caption of Fig. 2 that the exchange of information between domains is two-way. If this is correct, the inner domains provide feedback to their parent domains. This means that the wind at a given resolution contains information of the wind at higher resolutions. The comparison presented does not show a clean analysis of the role of horizontal resolution. The best way to analyze the impact of horizontal resolution is to run WRF with the domains exchanging information in one-way (from the mother domain to the finer domain).

3. Page 5442, lines 10-12: Are you using hourly averages to compare with 10-min obs? Why not average hourly the observations or use instantaneous WRF outputs to compare with the 10-min observations?

4. Page 5442, lines 17-18: It is mentioned that the measurement height of the sensors differs and that the modeled winds are linearly interpolated to the height of the sensors. The authors should provide a description of the height of the wind sensors and what is the location of the lowest model levels to have an idea of how accurate is the interpolation. How accurate is a linear interpolation at sensors located very close to the ground?

5. Page 5452, line 18. The negative bias in the wind directions is systematic. Do the authors have an explanation for this?

6. ERA-Interim is not properly capitalize several times.

7. It is very difficult to identify the line corresponding to each experiments in Fig. 4-7.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

The authors should find new style conventions to avoid confusion.

8. It is probably a good idea to indicate in the title that the focus is on wind storms. The conclusions of the article are valid for these extreme conditions. Conclusions may differ for other synoptic situations.

9. Closely related to the previous comment, the conclusions apply for cases of extreme winds. This should be stated clearer in the conclusions. The best WRF configuration may not be the same for weak wind conditions for instance.

Interactive comment on Geosci. Model Dev. Discuss., 8, 5437, 2015.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper