

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.

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We thank the anonymous reviewer for carefully reading the manuscript and his/her positive view on it. We believe his/her very constructive comments will allow us to improve the current version of the manuscript. We discuss below the major points raised by the reviewer. All minor comments and changes in the text have been taken into account and implemented, including the change in the colour scheme used in many figures.

The use of a power law to account for the different heights of the measures was indeed used in an early state of the work. However, at some point we decided to change it and

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to use the three dimensional information of the model, since we believe that the use of the power law is itself a very crude approximation to the problem. In any case, and as properly guessed by the reviewer, the difference in both approaches is very small, and negligible in the results shown in the figures through the paper, so we finally decided not to include the discussion of this detail in the former version of the manuscript. We believe that discussing this small detail is not a prominent added value in the paper, so we do not show the figures for both approaches for the sake of simplicity. However, in the revised version we have included the remark of the insensitivity of the results to the vertical interpolation.

We have improved the explanation of the YSU* scheme, in particular the change to account for underestimation of wind in the summits, which indeed explains part of the biases we report in the results.

We have enriched the discussion of the results in the context of the Garcia-Diez et al. (2015) article, that was not available by the time when the first draft of this article was submitted.

Unfortunately we do not have a full explanation for the slight but systematic southern bias towards in the win direction. Still, the most likely candidate is, in the opinion of the authors, the representativity error. The 2 km resolution is not fine enough to resolve the complex topography of the Alps, particularly over valleys, which have a clear potential to channel wind into preferred directions. Thus, the misrepresentation of an observational site in the model can lead to this type of biases. Still, further research, and the analysis of continuous runs, not specifically focused on wind storms, would be necessary to fully address this problem.

Finally, the remark regarding the fact that our analysis could be underestimating the role of nudging due to having set the focus of the paper on wind storms has been included through the manuscript and in the conclusions.