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WIND ENERGY SCIENCE DISCUSSIONS

Interactive comment on "Mountain waves impact wind power generation" *by* Caroline Draxl et al.

Anonymous Referee #2

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1 General comments

The paper present an interesting overview of the effect of mountain induced waves on wind farm power generation. It is an easy read and an interesting topic. I do think with some work the paper could be sharpened and for such a short paper the number of figures seems excessive. I also have some issues with the WRF model setup.

2 Specific comments

1. The WRF description lacks a lot of details and could be inadequate to model the phenomena described in the paper (difficult to judge due to missing description). For example, the ERA-interim data are used as boundary conditions, but these

are at a 80 km resolution so they will lack many of scales between 80 and the 3 km that is the outer domain size of the WRF simulations used in the study. The outer domain should generally be at similar spacing of the reanalysis data used for the boundary conditions and then gradually refined using nested domains. If not, a larger buffer zone needs to be present between the reanalysis to the site of interest, but this seems not to be the case judging from Fig. 3, since winds are presumable mostly from the west. There is a larger distance between the 3 km and 750 m domain at the east side, but this is not useful because the wind is not coming from that direction. It is mentioned that there is a description in Allaerts et al., but that paper is only submitted, so as long as it is not accepted it has to be presented in this paper first. Because the paper specifically deals with waves at the scales of 10-20 km, it seems that these need to be properly resolved.

2. Many of the plots are not really needed: for example, figure 7 and 8 are only discussed in a couple of lines. The message of these plots could easily be replaced by a few lines of text.

3 Technical corrections

- l60: There is no Wells et al. in the references
- l71: Remove space before point
- l108: Was there any filtering with respect to CNR threshold or other quality control?
- l115: Please add reference for filtering/setup of the sodar.
- l210: Brunt-Vaisala -> Brunt-Väisälä

- l132: What is temporal resolution of GOES-14?
- l136: Mellow->Mellor + add reference to the PBL scheme (Nakanishi et al.).
- l139: Isn't it usual to switch of the cumulus schemes already at those resolutions?
- l144: Was there any grid or spectral nudging performed? I think it is a good practice anyway to include the WRF namelist, because then people can easily reproduce the results.
- l156: What was their criteria for defining topographic wakes?
- l180: left) -> (Fig. 6, left)?
- l205: Fig 6. panel c: I think this would be easier to see when you plot vertical motions as red (positive) and blue (negative). Now it seems like there is only positive motions and it is not easy to distinguish wave patterns.
- l210: Brunt-Vaisala -> Brunt-Väisälä
- l281: It is not clear to me how the reconstruction is done. Please clarify.
- Fig 11b: units missing for colorbar.
- l303: Hovmoller -> Hövmöller (occurs in more places)
- l326: approximately10 -> approximately 10
- l340: Wake effects play a role at all farms, I assume. Please explain this in more detail.

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