Answers to the editor corresponding to the manuscript: Turbulent kinetic energy over large offshore wind farms observed and simulated by the mesoscale model WRF (3.8.1)

The comments of the editor and the corresponding answers of the authors are written in black and in green, respectively.

Comments to the Author:
Dear Authors

the manuscript is close to acceptance.

1.) Often read, but still wrong: Temperatures are low/high, they are definitely not cold or warm (in the same way, humidity is not dry and a speed is not fast!). Please check the whole manuscript for this, in particular sec. 3.1 and sec. 6.

Thanks for the catch!

2.) Could you expand sec. 5.3. by a few sentences? For me a few questions remain. Would you normally consider the advection of TKE the better modelling choice? For me it sounds like including the process should make the simulations more realistic. Why do you find the opposite when you look at TKE above windfarms?

Sure! We expanded section 5.3 by the following sentences:

The simulated TKE within the wake is in the order of 0.6-0.8 m^2 s^{-2} meaning that the simulated TKE in the wake is more than twice as high than in the undisturbed flow. This finding is in contrast to the observations reported in Platis et al. (2017), they measured lower TKE values within the wake than in the ambient flow during stable conditions. Summarized, although it is expected that the advection of TKE is supposed to improve generally mesoscale simulations, we observed here two drawbacks with respect to the wind farm parameterization of Fitch et al. (2016). Firstly, the TKE above the wind farm was too low associated with too high wind speeds above the wind farm. Secondly, according to airborne observations of Platis et al. (2017) the TKE within the wake is lower than in the ambient flow, in contrast, activating the TKE advection option results in an enhanced TKE within the wake. Therefore, we conclude not using the TKE advection option for wake simulations during stable conditions at offshore sites. P20L14-22

Language issues:
p.1, l.15: has gained?

Yes, I guess so. Done. P1L15

p.5, l.9: at around ..

Done. P5L9

p.8, l.6: A_ikj = A_ijk??

Great catch, thanks! We renamed A_ikj to A_ijk to make the syntax consistent with V_ijk

p.23, l.2: the size

Done. P23L8

p.23, l.14: In THE model, the wind farm WAKE ...? Or do you really mean the wind farm extends ...

Correct, we really mean the wind farm! P23L20

Citation Fraunhofer not Frauenhofer!

Thanks for the catch!