

Reviewer comments on the paper

Assessing the Accuracy of a Three-Year High-Resolution Mesoscale Wind Farm Wake Simulation with Lidar and Satellite Radar Data

General comments

The authors have addressed my comments and suggestions very well. Thus, I believe this paper can be accepted for publication.

I have left a few minor comments below, which I trust the authors will consider carefully, as they have throughout the review process. I do not believe another round of review is necessary.

Specific comments

- 1) Is the momentum deficit metric introduced in Eq. (4) a temporal tendency or not? Based on the N/m² unit, it looks like a temporal tendency. If so, please clarify in the text that it refers to a temporal rate of change in momentum.
- 2) You present U_{wf} as a 2D field to compute the wind speed deficit, but also use it for turbine thrust in Eq. (5). Naming a new variable to represent the hub-height wind speed within a grid cell would be more appropriate e.g., U_{hub} .
- 3) Can you clarify the meaning of “momentum redistribution”? Perhaps wake recovery or the spatial advection and mixing of the wind speed deficit? If so, I would modify this statement as follows: “the concurrent expansion of the 5% wind speed deficit area results in greater downstream momentum **recovery**.” If not, I would briefly explain the meaning of “momentum redistribution”, which appears two times and without prior explanation in the text.
- 4) In the Abstract, perhaps the following modification improves the flow: “..within **and upstream** the wind farms”.
- 5) Explicitly stating that the sentence below refers to wind-farm wakes rather than to individual turbine wakes is important, as mesoscale simulations cannot represent turbine wake structure. In the Abstract, I would replace “..effectively captures the wake structures” with “**effectively captures the larger-scale structure and wind speed deficit of the wind-farm wake**”.

Technical corrections

- 1) Figure 15 needs X and Y axis dimensions.