Response to the Editor's Comments

Manuscript title: Influence of simple terrain on the spatial variability of a low-level jet and wind farm performance in the AWAKEN field campaign
Journal: *Wind Energy Science*

Editor's comments – Regular font
Authors' comments – **Bold font**

Public justification (visible to the public if the article is accepted and published):

Dear authors.

The two reviewers are satisfied with the revisions to the manuscript and recommend publication as it is. I agree with their assessment, but I have a few minor corrections listed below. Thank you for choosing WES for your publication, and once again, I apologize for the lengthy review process.

Dear Editor,

We thank you for your careful reading and helpful suggestions. Please find our point-by-point responses below:

L67-68. "power performance" should perhaps be "the performance of a wind turbine" or something like this. Wind turbines suddenly appear in the text

The phrase "power performance" was revised to clarify the context and introduce wind turbines earlier. The sentence now reads: "The terrain-induced variability in wind speed during SBLs and LLJs causes important spatial differences in the performance of wind turbines operating in complex terrain."

L70-71. "wind farms built in complex." Something about wind farms is being studied; otherwise, the sentence is a bit weird.

The sentence was revised for clarity. It now reads: "In Radünz et al. (2021), wind farms located in complex terrain exhibited surprising performance

patterns: turbines in the back rows sometimes produced twice as much power as those in the front rows, despite being affected by wake effects."

L80. IMO "American WAKe ExperimeNt" is not necessary, just write "American Wake Experiment"

We appreciate the suggestion regarding the stylization of "American WAKE ExperimeNt." However, we chose to retain the stylized version to remain consistent with the official naming convention used by the AWAKEN project consortium, as published in Moriarty et al. (2024) and Bodini et al. (2024). The full name appears only twice in the manuscript, and we otherwise refer to the project as AWAKEN throughout.

Moriarty et al. (2024). Overview of preparation for the American WAKE ExperimeNt (AWAKEN). *Journal of Renewable and Sustainable Energy*, *16*(5). https://doi.org/10.1063/5.0141683

Bodini et al. (2024). An international benchmark for wind plant wakes from the American WAKE ExperimeNt (AWAKEN). *Journal of Physics: Conference Series*, *2767*(9). https://doi.org/10.1088/1742-6596/2767/9/092034

In several places: I would add "model" after WRF; otherwise, the sentences don't make sense.

We have added the word "model" after "WRF" in all relevant instances to improve clarity.

Figures 10-12. If it is easy to do, could all the x-axis be of identical size? I think it will facilitate understanding.

We revised these figures so that all x-axes now have identical sizes, as suggested.

Please update the reference to Wise et al. 2024; the paper has now been published. Please ensure all citations are valid.

The reference to Wise et al. (2024) has been updated. All citations have been verified for consistency, and journal names were abbreviated accordingly.

We also appreciate your kind acknowledgment regarding the length of the review process and fully understand that such delays can happen. Thank you again for your guidance and for the opportunity to publish our work in Wind Energy Science.

Sincerely,
The authors