

General comments:

My major concern in this version of the manuscript is the lack of explanation and validation of what the authors refer to as “volumetric approach” of data retrieval. The methods section (around lines 195-200) mentions spatial averaging of wind speed measurement across the entire range of the scans (9 km) and the entire azimuth sector, but the validity of this approach is not discussed. While negligibility of vertical wind velocity component is a more or less established convention, homogeneity of the wind field over such a large distance is not self-evident. The analysis would benefit from an assessment of this assumption. Has such approach been used in any other studies reported in the literature? I see that in the discussion section the authors report a comparison of their data with a wind turbine’s operational data and with Visich & Conan (2025)’s “metmast method”. However, these comparisons are only mentioned briefly with no supporting evidence in the form of scatter plots or other reasonable visualization. A rigorous validation study similar to what the authors described in Appendix A for SST and atmospheric stability is much needed for the wind speed & direction analysis, especially given that this is the actual core of the work.

It would also be beneficial for the overall clarity to emphasize (e.g. in the conclusion) that the study only accounts for the LLJs in the incoming winds for a particular wind farm and does not reflect the total occurrence of LLSs in a location.

Remarks:

1. Line 144: please specify how many scans were performed per measurement
2. Table 1 in Elevation angles: please specify in the text/caption that -0.2 stands for the single measurement outside of the range (it’s not very evident)
3. Line 184: please elaborate on why these measurements are uncertain
4. Figure 2: consider marking range gates in subfigure (a)
5. Eq. 6: please explain the abbreviation. I guess PO stands for power output and TI for turbulent intensity, implying that the fluctuations are due to turbulence, but it’s not very clear from the text.
6. Lines 308-309: please summarize and/or visualize the proportion of profiles discarded at the different stages of data preprocessing
7. Line 328-329: consider replacing “our measurements” with “the lidar measurements” to make a clearer distinction between the lidar data (within a restricted wind direction sector) and the nacelle anemometer data (presumably unrestricted). Also, were the nacelle data somehow filtered? Could it happen that the lower wind speeds from north and east are due to the turbine wakes?
8. Figure 6: does 0.2 correspond to the smaller circle in the map and 0.3 to the bigger one? The labels are slightly off.
9. Figure 7: wouldn’t it make more sense to use local time (CET) for this graph and not UTC?
10. Figure 9: N refers to LLJ counts? Also, consider adding some white space between the subfigures for better readability
11. Lines 401 to 408: the descriptions seem to be mixed up. The second paragraph should probably refer to Figure 13b (not 13a) and describe veer, not shear (line 407).
12. Line 409: please add what TI stands for
13. Line 469: the sentence adding with “...conclusions about this region” – meaning “this region only”, as opposed to other regions?

Small issues:

1. Line 11: the sentence starting with “Comparing situations with...” would be more clear with “revealed that” instead of the comma after “REWS”
2. No need for commas: line 32 after “showed”; line 62 after “pointed out”; line 80 after “simulations”; line 336 after “shows”; line 362 after “find”; line 363 after “area”; line 404 after “observe”;
3. Comma needed: line 114 after “REWS”
4. Line 257: the sentence starting with “The different segments...” is clumsily phrased. Did the authors mean “the segments span ... heights”?
5. Line 352: “as” needed before “Table 6” (or else “that” instead of the comma after “shows”)

6. Line 402: “profiles” instead of “profile”
7. Line 406-407: the sentence starting with “Again, a strong...” would be more clear if phrased like “power production is seen to decrease strongly with increasing shear”.
8. Line 421: “the” not needed before “several”