

WES-2025-12 - Response to Reviewer 2

(The reviewer's comments are in italics)

We thank the Reviewer for their time and feedback on our manuscript. We address their concerns below. The Reviewer's comments are in *italics*. Our replies follow each comment. Changes made to the manuscript for Reviewer 2 are highlighted in blue. Author initiated changes are in turquoise.

This manuscript explains open database obtained by 3 years' measurement campaign in an onshore wind farm, which include wind speed/direction and turbulence components measured by cup and sonic anemometer, temperature measured by radiometer, SCADA data and blade shape obtained by 3D scan. This kind of database is very important for future research and will be contribute to industry. However, only introducing or explaining database is not enough for scientific journal paper. Although it's great effort and there are some interesting topics, it should be added more detail explanation about data quality, scientific insight, new findings etc.

In conclusion, a reviewer suggests MAJOR REVISION of this manuscript.

Specific Comments

Section 1

- **Overall** - *There is no literatures review. Although the authors quote 5 references, all these are not journal papers. Because this is research article, the authors should refer not only industry work but also journal paper. The authors should explain about previous researches, differences between previous researches and this manuscript etc*

Reply: The present manuscript is a data description paper, not a research article. The co-authors believe that they have properly followed the journal recommendations on data description papers. Please refer to the Wind Energy Science webpage describing the manuscript type: "Data description papers describe original and FAIR research data, and the planning, instrumentation, and execution of experiments, collection or generation of data. Articles may describe field or lab-scale observational data, simulation data, or combinations thereof. Although examples of data outcomes may prove necessary to demonstrate data quality, extensive interpretations of data – i.e. detailed analyses as an author might report in a research article – remain outside the scope of this manuscript type. https://www.wind-energy-science.net/about/manuscript_types.html"

- **Ll. 18-36** - *Although, the authors raise 4 originalities of present database, it is hard to understand the originality.*
"Operational Wind Turbine (SCADA) Data" already exists, as the authors explained. "Measurement of Wind Properties": Sonic anemometer is commonly used for boundary layer and turbulence structure research and open data might exist. "Expansion of the Database Applications" and "Future Benchmarking" are about future work and not

explaining originality of database in this manuscript.

The authors have to explain the originality of present database more clearly.

Reply: As mentioned in the introduction, access to turbine data (SCADA information, blade geometry, ...) together with meteorological and turbulence measurements is only possible through collaborations between academia and industry. These data are generally restricted due to confidentiality reasons. Compared to other available data sets, the volume of the meteorological mast and SCADA data sets is more extensive, the blade geometry is provided, and temperature and humidity profiles derived from radiometer measurements are included.

- **L. 30** - *It is hard to understand the meaning of “same wind farm environment”. Is that same meaning of “same wind farm”?*

Reply: Yes, this is the same wind farm site. It has been clarified (ll. 29): “This initial database serves as the foundation for further data sets generated [within the same wind farm site](#).”

- **L. 31** - *“AERISwebsitehttp://...” Need space between website and the URL. It is suggested to put URL in brackets*

Reply: This has been corrected.

Section 1.1

- **L. 42** - *Equivalent to $4D \rightarrow 3.8D$*

Reply: This has been corrected.

- **Table 1** - *Longitude $-1.9XXX^{\circ}W$ is correct? Or typo of $1.9XXX^{\circ}W$ or $-1.9XXX^{\circ}E$?*

Reply: This has been corrected, thank you for pointing it out.

Section 2

- **Figure 2** - *It is suggested to align vertical axis of figure 2-(a) and 2-(b).*

Reply: This has been corrected.

- **Figure 3** - *Image resolution of figure 3-(a) and 3-(b) are bad. It should be replaced by higher ones. Also, figure should be quoted and explained in somewhere in main body.*

Reply: Figure 3 is now referenced in the text, and the image resolution has been improved.

- **Ll. 61-69** - *Flow distortion effect caused by met mast is important to evaluate reliability of wind measurement. At least, mounting direction of each anemometer should be mentioned. Adding figure of x-y planes, explanation of length of mounting booms, frequency of calibrations, standard or guidelines followed are preferable.*

Reply: This has been updated with the following text:

“The lower levels’ sonic anemometers (10 m, 41.8 m, , and 53.5 m) are mounted on a 2 m boom pointing to 302°. This orientation is chosen in order to minimize the time spent in the wake of the mast, as 120° wind does not occur often as shown by the wind roses.”

- **L. 69** - *The date when sonic anemometers were replaced should be explained.*

Reply: This has been updated with the following text:

“During the field experiment, the top (December 2020) and 41.8 m (February 2022) anemometers were replaced with two Gill WindMaster Pro sonic anemometers due to failure of the installed one.”

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- **L. 72** - *In general, 10-min statistics are used especially for turbulence parameters. Why the authors decided to compute 1-hour statistics? Need explanation*

Reply: 1-hour turbulence statistics were calculated using 20 Hz data sets from the sonic anemometers. This was chosen as a first approach for the data release to resolve large scales that dominate the atmospheric energy spectra. For instance, this is used to compute atmospheric stability. It can be adapted and reprocessed later, depending on the user demand.

- **Ll. 86-87** - *The authors say “Statistical convergence is not acceptable (i.e., [105°-150°]).”, however, the reasons are not clearly mentioned. Need explanation*

Reply: For these wind orientations, the sonic anemometer is in the wake of the meteorologic mast, preventing interpretable results. This has been clarified in the manuscript (ll. 86):

“Green dots represent wind directions where the met mast is not affected by turbine wakes and where statistical convergence is acceptable (i.e., [90° – 105°] ; [150° – 240°] and [285° – 300°]). In contrast, black dots indicate wind directions where the met mast is impacted by wind turbine wakes (i.e., [0° – 90°] ; [240° – 285°] and [300° – 360°]), or where the sonic anemometer is in the wake of the meteorologic mast (i.e., [105°–150°]).”

- **Ll. 88, 89** - *s language “wake interactions” correct? Or is it just mean “wake effect”? If there is interaction, the author need to explain more details about the phenomena.*

Reply: Yes, it is the same as wake effect. We replaced “wake interaction” by “wake effect” and we clarified that it corresponds to the interaction between a wind turbine wake and the met mast (ll. 86):

“Green dots represent wind directions where the met mast is not affected by turbine wakes and where statistical convergence is acceptable (i.e., [90° – 105°] ; [150° – 240°] and [285° – 300°]). In contrast, black dots indicate wind directions where the met mast

is impacted by wind turbine wakes (i.e., $[0^\circ - 90^\circ]$; $[240^\circ - 285^\circ]$ and $[300^\circ - 360^\circ]$) , or where the sonic anemometer is in the wake of the meteorologic mast (i.e., $[105^\circ - 150^\circ]$).”

- **Ll. 89-90** - *Although the authors say “The footprint... less sensitive to altitude”. It is hard to understand if this sentence is correct only from figure 5. Add more explanation about the reason that the authors think so in text or figure.*

Reply: Yes, this statement is based on Fig. 5. In this figure, one notices that the turbulence intensity measured for wind directions where the met mast is affected by turbine wakes is not sensitive to the altitude. It is not the purpose of a data paper to interpret the results in a more extensive way.

Section 3

- **Ll. 101-102** - *“The vertical resolution of the profiles...” The explanations of altitudes such as “atmospheric boundary layer, lower free troposphere, etc.” are very ambiguous. It should be more clearly explained the relation of altitude and resolution as numeric.*

Reply: We replaced the unclear paragraph by the following more detailed paragraph (ll. 104):

“The first levels of the vertical profiles are 10, 25, 50 and 75 m above ground level (agl). Above this, the vertical resolution of the profiles ranges from 30 to 40 m between 100 m and 1200 m agl, corresponding approximately to the atmospheric boundary layer. Then, up to 10 km agl, the resolution varies between 60 and 300 m.”

Section 4

- **Figure 8** - *Add reference if this figure is already published as somehow (e.g. report, webpage etc.).*

Reply: The reference, Lebranchu (2016), has been added.

- **Figure 8** - *Caption is incorrect. It must be “(10) yaw bearing, (11) nacelle”.*

Reply: This has been corrected.

- **Table 2** - *“Nacelle height” should be “hub height”.*

Reply: This has been corrected.

- **Table 2** - *What does the meaning of “Average weight”? Also, “rotor without blades” is “hub” and “nacelle without rotor” is “nacelle”, in general. Is there any reason that the authors call that way?*

Reply: These are terms employed by the manufacturer in their documents. We did not measure anything, the information was extracted from documents provided to VALEMO. We kept these terms for consistency with these documents. We however clarify now in the caption of Table 2 that these values are extracted from technical documents provided by the wind turbine manufacturer at its acquisition:

“Characteristics of the wind turbines extracted from technical documents provided by the wind turbine manufacturer at its acquisition.”

- **L. 114, Title** - Title is “Description of the Wind Turbine” and seems explain about only wind turbine. However, main subject of this manuscript is database. It is suggested to change title as “Description of the SCADA data” or “Description of the Wind Turbine and SCADA data”

Reply: This has been corrected.

- **L. 120** - Although the authors say that “All wind turbine are equipped SCADA...”, the authors also say that “SCADA data from four of the six turbines are included ...” in line 12. It should be clearly explained that which turbines’ SCADA data is available in present database.

Reply: This has been specified in the added Section 8 (ll. 271; color of Reviewer 1): “For reasons of confidentiality, the data is available for four of the six turbines.”

- **Table 2** - It is suggested to add cut-in, rated and cut-out wind speeds, as general information.

Reply: The information has been added to Table 2.

- **L. 130** - What does “azimuth error” mean here? Is that same meaning of “yaw misalignment”?

Reply: Yes, it refers to yaw misalignment. It has been replaced for clarity.

“Both wind speed and wind direction are corrected for deviations caused by rotor rotation (which also varies according to wind speed and yaw misalignment), although the transfer functions used for these corrections are not provided by the manufacturer and remain unknown.”

- **Ll. 129-131** - The expression of this sentence is very ambiguous and not clear if data would be provided by present manuscript is corrected as black-box or couldn’t correct due to lack of information. More clear explanation is needed

Reply: Anemometers are placed on the nacelle behind the rotor. This induces deviations in the wind speed and yaw measurements that can be removed using a transfer function. This transfer function has been applied in the available data, we however cannot go back to the raw data as the transfer function is unknown because not provided by the manufacturer.

The text has been updated:

“Both wind speed and wind direction are corrected for deviations caused by rotor rotation (which also varies according to wind speed and yaw misalignment), although the transfer functions used for these corrections are not provided by the manufacturer and remain unknown.”

- **Ll. 137, 138** - *rotation* → *rotational speed or rotational frequency*

Reply: The related sentences have been reformulated for clarity.

Section 5

- **Figure 10, 11** - *Figure 11 is referred earlier than figure 10 in main text. The authors should reconsider the order of those figures.*

Reply: This has been corrected.

Section 5.1.1

- **L. 158** - *Is “obscured by the mast” intent “obscured by the tower”? If so, it should be corrected*

Reply: Yes, this has been corrected.

- **Ll. 167, 216** - *Is “82% of the rotor diameter” correct? Or does it intent “82% of blade length”*

Reply: “82% of the blade length”, this has been corrected.

- **L. 175** - *(see Figures 12a) and b) → (see Figures 12a) and b))*

Reply: This has been corrected.

- **Figure 12** - *Image resolution of figure 12-(a), 12-(b) and 12-(c) are bad. It should be replaced by higher ones*

Reply: Figure 12-(a) and (b) were originally smaller which explains this bad image quality. To improve the image quality, the only option is to keep the original image size. Figure 12 (c) was of high quality already and was unchanged.

- **Ll. 155, 179** - *It is suggested to mentions about weather condition such as wind speed for day of scan work.*

Reply: The wind speed was 3.57 m/s for the second scan. It has been added.

- **L. 192** - *mast* → *tower*

Reply: This has been corrected.

Section 6/Abstract

- **Overall** - *It is difficult to understand originality, new findings etc. of this manuscript. The authors should reconsider of these clauses based on reviewer’s comments and its modification. Needless to say, general comment and some of comment on clause 1 are highly important.*

Reply: Again, this is a data paper, not a research paper (see first response).

References

Lebranchu, A.: Analyse de données de surveillance et synthèse d'indicateurs de défauts et de dégradation pour l'aide à la maintenance prédictive de parcs de turbines éoliennes. Traitement du signal et de l'image, Ph.D. thesis, Université Grenoble Alpes, URL <https://theses.hal.science/tel-01503571v2>, 2016.