WES-2025-12 - Response to Reviewer 1

(The reviewer's comments are in italics)

The authors 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 1 are highlighted in purple. Author initiated changes are in turquoise.

Suggested Revisions:

1. ***data set Format and Organization**: Add more information about the data formats used. Consider including a summary paragraph on data set organization (e.g., "data set XX is stored in NetCDF format with standardized metadata following XYZ guidelines.").*

   Reply: A summary paragraph on data organization and format has been added at the end of the manuscript in Chapter 9 as follows:
   "**Section 8 Data-set format and organization**

   - Meteorological mast data sets are stored in CSV format and organized in three directories: "data availability", "meteo", and "turbulence". The "data availability" directory provides availabilities of the meteorological data sets in CSV format (also shown in Figure 16). The "meteo" directory contains atmospheric data from cup anemometers, a wind vane, a thermometer and an atmospheric pressure sensor. The "turbulence" directory contains the sonic anemometer measurements at the four meteorologic mast heights detailed in the README file.
   - Radiometer data set are stored in NetCDF format and organized in four directories: The CMP.TPC folder contains atmospheric temperature profile data collected over time. The file includes time-indexed measurements across 93 altitude layers, along with metadata and rain flag. The HPC folder contains vertical profiles of absolute and relative humidity collected over time across the atmospheric layers. The data includes metadata on measurement conditions and auxiliary quality indicators such as rain detection. The IWV folder contains time-resolved measurements of Integrated Water Vapor (IWV), along with viewing geometry, retrieval method, and rain flag. The MET folder contains NetCDF files of meteorological measurements (observed at 3 m agl) including pressure, temperature and relative humidity at a temporal resolution of 1 s. Each entry corresponds to a single point in time and includes metadata such as rain status and integration details.
   - SCADA data sets are stored in CSV format and organized in three directories: the "DATA" directory contains the CSV files, the "AVAILABILITY" directory pro-

vides availabilities of SCADE data (also shown in Figure 16 of the manuscript) and "MANUFACTURER-INFORMATION" contains the power and thrust curves. For reasons of confidentiality, the data is available for four of the six turbines only. More details on the data organization can be found in the README.txt file.

- The blade scan data can be read using the CSV format as performed in the provided python code "plot-3DBlade.py". The README.txt file explain the content of the directory, including filenames "Rxxm.txt" which contain the 2D airfoil profiles composing the 3D blade."

2. *Please state why some data is unavailable, e.g., SCADA from the two remaining turbines. Was it a requirement from the data provider or something else?*

   Reply: This has been specified now in the new Section 8:

   "For reasons of confidentiality, the data is available for four of the six turbines only."

3. ***Terminology Consistency**: Table 2 lists "nacelle height" as 80 m, while the text states "hub height" is 80 m. Please clarify this and ensure consistent terminology.*

   Reply: "Nacelle" has been replaced by "hub" in Table 2.

4. ***AERIS Platform**: Provide additional information on the AERIS platform. For example, does it guarantee continuous access for many years into the future?*

   Reply: Aeris has existed for 10 years and relies on French ministry engagements (CNRS, CNES, Météo France, ...). It is part of four data centers and services that share a certain number of tools which, in case of permanent or temporary failure, can take over data storage and distribution. One of these data centers (ESPRI) is Core Trust Seal certified. The SEDOO data center, where the present data are stored, has introduced a high quality service around data conservation, and is in the process of obtaining of the same certification as ESPRI. SEDOO is a data service dedicated to developing tools for storing, managing, processing, and sharing environmental scientific data. SEDOO supports regional data management needs, contributes nationally through its involvement in the AERIS and ODATIS data hubs and long-term environmental monitoring services, and participates internationally in major scientific programs and multidisciplinary measurement campaigns (`https://www.sedoo.fr`).

5. ***Figure and Table Improvements:***

   (a) Figure 5 appears grainy; please improve the image quality.

   (b) Figures 4, 5, 6, 7, 9, and 16: Add subplot labels (a), (b), (c), etc., unless they are considered single plots.

   (c) Table 3: Add more detailed descriptions of columns and rows. Consider explaining terms such as "NACA 63(3)418," "Max. Camber [%]," and "at x/c [%]," and

perhaps include an illustration of camber and thickness (add to one of the previous figures if possible).

Reply:

(a) The image resolution of Figure 5 has been improved.

(b) Subplot labels have been added.

(c) The caption of Table 3 has been extended to explain terms in the table:
"Airfoil shape characteristics: The columns contain the airfoil maximum thickness and its location in percentage of the chord, and the maximum camber and its location in percentage of the chord . The two first rows of this table show the airfoil properties for the two scanned cases, while the third row correspond to the original (not modified) NACA profile shape, namely a NACA 63(3)418 profile, as a reference. The fourth row corresponds to a NACA 63(3)418 profile modified in such a way that it fits the scanned data."
The original NACA profile is an airfoil shape referenced here: `https://m-selig.ae.illinois.edu/`. The URL has been added (footnote 8). To avoid overloading figures, a clear definition of an airfoil camber and thickness has been added in footnotes 9 and 10:
9: "The thickness is the maximum difference between the upper and lower airfoil surfaces divided by the chord length"
10: "The mean camber line is an imaginary line which lies halfway between the upper surface and lower surface of the airfoil and intersects the chord line at the leading and trailing edges"

6. ***Acronyms and Notation:*** *Define CSTB, LHEEA, ISIS-CFD, NACA 63(3)418, and URANS, and provide references where possible.*

   Reply: These acronyms and notations have been added in the manuscript. CSTB is a French research center (Centre Scientifique et Technique du Bâtiment; footnote 5), LHEEA is a French research laboratory (Laboratoire de recherche en Hydrodynamique, Énergétique et Environnement Atmosphérique; footnote 2), ISIS-CFD is a CFD solver developed and maintained by the LHEEA laboratory and sold by NUMECA via the FINE^{TM}/Marine Suite (footnote 6), and NACA 63(3)418, as explained above, refers to a profile type from the NACA series. U-RANS stands for Unteady Reynolds-Averaged Navier-Stokes equations (footnote 3).

7. *Clarifications and Formatting:*

   (a) Line 76: Add a space between the number and unit ("79 m").

   (b) Line 236: Consider moving the last line up to align with the preceding paragraph.

   (c) Explain if "hNN" refers to height above "normal null," as this may not be self-evident in the wind energy community.

(d) Introduce and clarify the notation "Re_c."

Reply:

(a) This has been corrected.

(b) This has been corrected.

(c) This is the height above sea level. It has been renamed by h_{asl} for clarity.

(d) Re_c is the airfoil chord based Reynolds number defined as $Re_c = Uc/\nu$ with U the free-stream velocity, c the airfoil chord and ν the kinematic viscosity. It is well known in the aerodynamics community. It has been clarified in the manuscript in footnote 4.

Data File Review:

1. *Meteorological Mast data set(s):*

   (a) ***data_availability folder****: Format: .csv files. Missing README. Files open correctly using Pandas.*

   (b) ***meteo folder****: Format: .cvl file (tab-separated ASCII). It is fair README, but it could describe more about the data formatting and standards (if any). Files open correctly using Pandas.*

   (c) ***Turbulence folder****: Format: .csv files (one per height). Good README. Files open correctly using Pandas.*

   Reply: We have now added a README file in the data_availability folder.

2. ***Radiometer data set(s):***

   (a) General Issues:

      i. "readme_v1.rtf" contains a netCDF header dump but lacks a general description of folders, files, and formats.

      ii. The "IWV" and "MET" folders are empty and undocumented.

      iii. The "Preliminary_Version" folder contains HPC, CMP, and IWV netCDF files, but their purpose is unclear.

   (b) File-specific Notes:

      i. "lire_cmp_tpc.py": Python script to parse files. Could include more details about the purpose and docstrings for the functions.

      ii. "CMP_TPC_report.csv": List of days with missing or present netCDF files (CMP_TPC).

iii. "CMP.TPC" folder: Daily netCDF files (opens fine using xarray, but missing README apart from readme_v1.rtf).

iv. "HPC" folder: Daily netCDF files (opens fine using xarray, but missing README apart from readme_v1.rtf).

Reply:

(a) General Issues:

i. We have now added a README file to each folder (CMP.TPC, HPC, IWV, and MET, as described above), providing a description of the NetCDF file content.

ii. The corresponding files are now uploaded with a descriptive README file.

iii. The "Preliminary Version" folder was removed and replaced by V1 (Version 1) which is the latest version of the data.

(b) File-specific Notes:

i. The python code "lire cmp tpc.py" has been replaced by "lire cmp tpc v1.py" which includes more details about the purpose of the functions. This is an example code to read the content of the CMP.TPC NetCDF files.

ii. Yes, but for all files in each folder CMP.TPC, HPC, IWV, and MET.

iii. We have now added a README file to each folder, providing a description of the NetCDF file content.

iv. We have now added a README file to each folder, providing a description of the NetCDF file format used.

3. ***SCADA data set(s): DATA folder:***

(a) Format: Excel file

(b) Good README

(c) Files open correctly using Pandas (and Excel).

Reply: The format of these data sets has been modified in reply to Reviewer 3. They are now split into two files in CSV format, and we added a python code example to check the readability. The README file has been modified accordingly.

4. ***Blade Geometry data set(s):***

(a) Text files named RNNm.txt with NN being numbered from 00 to 44. Each file contains three columns. I assume "x," "y," and "z," but there are no headers, so I have to guess.

(b) The README contains useful information but lacks basic stuff, like file formats/standards description and information about who the "Authors" (people/institution(s)) of the data set are.

Reply: We added columns titles in the files (xb,yb,zb) in accordance with the data-paper. Authors were added in AERIS. The README file has been improved. A python code to plot the 3D blade has been added.