Dear reviewer,

Thank you for the comprehensive and helpful review of the proposed paper. Please find my answers and comments below:

General Comment:

- As there are three different heights of measurement, it is not clear from which height wind shear and turbulence intensity are considered for simulation. Please add it to the related section

Thanks for pointing this out. I included the following sentence in section 2.1 line 99:

As the IWT7.5-164 reference turbine has a hub height of 119.3 m all measurement data related investigations in the following are focusing on the measurement height of 119 m.

- Please explain why six seeds are used for each wind speed or reference it. According to IEC 61400-1, in the ultimate analysis, six seeds were used at a (below-rated wind speed – 2 m/s).

The reason for simulating six seeds per 10-minute interval is the same as in the IEC standards. According to IEC 61400-1 section 7.5 at least six 10-minute stochastic realizations of turbulent wind input are required for each mean, hub-height wind speed to ensure statistical reliability. Hence, the reference will be updated in line 174 of the paper.

Specific comment:

1. In Section 2.1, please add the goodness-of-fit of the Weibull distribution.

The fit of the Weibull-distribution shall only give some reference information on the characteristics of the site. Hence, the shape parameters of the fit are given to be able to do a more detailed comparison with the shape parameters suggested for the different site classes according to IEC 61400-1. As all investigations and simulations mentioned in the paper are referring to the raw measurement data the goodness of the fit has no impact on any of the results. However, for the sake of completeness the RMSD between data and fitted function was calculated and the legend entry of figure 1 was updated accordingly. In addition, the statement in line 101 was adjusted to be less confusing.

The site is generally characterized by rather low wind speeds.

2. The phrase "the wind speeds do not correlate well with any of the IEC wind classes" in Section 2.1 needs to be quantified.

You are right. When referring to a correlation a measure for this would be more comprehensive. However, as the focus is not set on the differences between measurements and distribution properties given in the standards but on how site-specific wind conditions and especially the medium-term intervals can affect wear in blade bearings, no quantitative measures are suggested. For the sake of completeness, the shape parameters for the fitted distribution are given in the figure for more in depth investigations.

3. It is not clear what the height of measurement is in figures 1 and 2. Please add the height in both figures.

You are right. The figure description was adjusted accordingly.

4. In figure 2, the last bin does not have a mean plus (red asterisk) value.

Thanks for pointing this out. Due to the lack of data points in the last bin, no standard deviation values are calculated. Hence, the last bin was deleted from figure 2 and figure 3.

5. In Section 2.1 and related to Figure 3, it seems that heights of 119 and 139 are used for the calculation of the shear exponent, and the projected wind speed results on 159 meters are compared with measurements. If that is the case, please include the results of the comparison. Otherwise, explain more about the process and comparison with measurement.

The exponent α which leads to the lowest error between power law function and measured data is used as an estimation for the shear. Figure 3 shows the obtained and bin sorted results for each dataset. The measurements at a height of $z_{hub} = 119\ m$ are used as V_{hub} in the context of the power law function (Eq. 1). All three measurements at 119 m, 139 m and 159 m are used to define α. I updated the sentences starting from line 113 accordingly:

Therefore, the wind speed measurements for each time step and for the three different heights are used to fit the power law function with a hub height of z_hub=119 m in Eq. 1

The exponent α which leads to the lowest error between power law function and measured data at all three heights is used as an estimation for the shear.

6. In the phrase "While the shear induces more pitch activity, the low TI leads to less variation in the oscillations of the bearings. It is therefore reasonable to assume a more wear-critical operation under the measured wind speeds in comparison to IEC classes." It is not clear how this judgment was reached. Please explain more.

The foregoing sentences beginning in line 123 are explaining, why the authors came up with this assumption. However, to give more context with respect to the risk of wear I included the following extension to this section of the text:

Without much variation in the oscillations and without larger movements due to lubrication runs the same spots of the raceways are in repeated contact with the rolling elements and the possibility of starved contact lubrication conditions is rising.

7. Wrong referred In line 238, Eq. (1) should be changed to Eq. (2).

Thanks for noticing. The reference was changed to the correct equation.

8. It seems Equation 5 has the wrong term. It has to be rewritten.

Again, thanks for noticing this detail. Equation 5 is correct, but equation 6 and 7 have incorrect terms. I corrected the equations as follows:

$$\theta_{51818} = \frac{di_{IWT}}{di_{51818}} \cdot \frac{(1+\gamma_{IWT})}{(1+\gamma_{51818})} \cdot \frac{2b_{51818}}{\widetilde{2b}_{IWT}} \cdot \theta_{IWT}$$

$$\theta_{13229} = \frac{di_{IWT}}{di_{13229}} \cdot \frac{(1+\gamma_{IWT})}{(1+\gamma_{13229})} \cdot \frac{2b_{13229}}{2b_{IWT}} \cdot \theta_{IWT}$$