Responses to the interactive comment on *"Validation of the dynamic wake meandering model with respect to loads and power production" by Inga Reinwardt et al., manuscript number: wes-2020-126*

Responses to Anonymous Referee #2

We are very thankful for your valuable comments on the paper. Your comments lead to significant improvements of the paper and have been taken into consideration. We thank you a lot for taking the time to review this paper.

Specific comments

p.2 – l.44-48: is this information really necessary for the reader?

Response: These references are less relevant for the paper than the previous ones and can be neglected.

p.5. – l.89: *Measurement results were analyzed from April 2019 to May 2020*. Please rephrase, it sounds like you are worked on analyzing the data in that time span.

Response: The sentence has been rephrased to: *"Measurement results from April 2019 to May 2020 have been used in the analysis."*

P.9. – l.193: What is the induction zone model? Please add a reference or explanation.

Response: It is explained above in Equation (2). A reference is given there as well.

P.13. – l.252 ff: You always refer to the rated wind speed, but you do not define it.
It can be seen from Figure 7 (a). Nevertheless, I would name it not to create confusion for the reader.

Response: Rated wind speed is 11 m/s and added in text.

p.16 – l.329: Here you mention the Wöhler coefficient. Is it the m=10 and m=4 specified in the header of the figures? If so please specify it before you use it the first time (Figure 9), otherwise the information in the title distracts the reader.

Response: The Wöhler coefficient is given in the title. A hint is given when Figure 9 is described.

p.18 – Figure 11: What are the numbers in the graph? You should mention again what they stand for. Maybe also in the caption.

Response: The Wöhler coefficient is given in the title. A hint is given when Figure 9 is described.

p.18 – Figure 11: What are the numbers in the graph? You should mention again what they stand for. Maybe also in the caption.

Response: The numbers illustrates the measured 10-min time series per wind direction bin. But I changed it and added a secondary axes with a bar graph according to the hints in the Technical corrections/comments.

 p.22 – l.405-406: *For the comparison measurements at the closest available lidar range gate that is still outside the rotor area of the downstream turbine is used, thus it happens that the downstream distance used in the simulations is slightly to low.* This is hard to understand. Please rephrase

Response: The lidar system does not measure directly at the downstream position of the rotor because only fixed 30 m range gates are measured, so that it has been measured some meters ahead of the turbine. To clarify this, the following sentence has been added: "*The lidar specifically measures in 30 m range gates, so that no measurements are available at the exact position of the downstream turbine.*"

Technical corrections/comments

p.4. – l.73: *Whole met mast and as depicted* Response: Has been adjusted.

p4. – l.82: *three turbines are equipped with load measurements equipment*. They cannot be equipped with measurements but equipment or similar. Response: Has been adjusted to: "*At last, at three turbines load measurement equipment is installed.*"

p.5: please refer to Table 1 in the text. Response: Has been adjusted.

P8. – l.169: Firstly instead of First. Response: Has been adjusted.

P9. – l.191: standard deviation*s*. Response: Has been reformulated.

P13. – l.250: *shown as a mean values* Response: Has been reformulated.

P14. – l.283: *with and and with an ambient* Response: Has been reformulated.

P15. – Figure 9: The numbers in the graph indicating the number of considered measurements are more confusing then informing. Maybe you could make an extra graph for them, which is valid for all four plots and, which indicates what you say in the text.
Response: To improve the graph's readability, a secondary axes with a bar plot has been added. It provides the number of measurements for each point in the graph.

P15. – Figure 10: Please be consistent with the fonts and the size of the text that you use for the figures. Figures 10 and 13 look very different from the other plots. Response: Has been adjusted.

p.22/23 – Figures 14, 15 and 16: Why do you use 3 separate figures here instead of before where you used one graph for all three cases? Furthermore, the blue line in normalized DEL graphs seems not fitting here. As you use the same legend for both graphs (just not in Figure 16?), the reader might get confused by the blue line colour as it would refer to "measurements". So I would suggest to use a different colour for this line.

Response: The graphs need to be bigger, hence they don't fit in one graph. Otherwise it is hard to read them with all the marks inside. The legend is adjusted in every graph. The blue line

with error bars are the complete measurements, whereas the blue circles are only the measurements were lidar data are available.