Wind Energ. Sci. Discuss., referee comment RC2
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Comment on wes-2021-133

Anonymous Referee #2

Referee comment on "Sensitivity Analysis of Turbine Fatigue and Ultimate Loads to Wind and Wake Characteristics in a Small Wind Farm" by Kelsey Shaler et al., Wind Energ. Sci. Discuss., https://doi.org/10.5194/wes-2021-133-RC2, 2022

The paper evaluates the influence of the wind inflow and wake parameters on fatigue and ultimate loads of wind turbines. It is a good paper with information that is of interest and, as far as I know, original. Nevertheless, there are aspects that require further comments and clarification.

- It is not clear why TI is considered a QoI; it is neither a fatigue nor an ultimate load, although it is obviously related to them.
- It should also be explained why a reference wind velocity is not included explicitly as an inflow parameter.
- In line 146, I suppose that the range of variation of Δ is that specified in tables 3 and 4. It may convenient to justify better how these ranges have been obtained; in lines 173 to 181 some references are just quoted, however a brief summary evaluating the reliability of the cited work and of the range values proposed may be also of interest.
- It is not clear whether figure 5 and table 5 refer only to blade root pitching moments as in figure 4, or to all Qoi…
- I cannot find specific comments in the text for Tables 5, 6 and 7, although their interpretation may be obvious. However, in tables 6 and 7 for WT2 and WT3, it looks as though percent differences (as indicated in eq. 5) are presented instead of the number of significant events. I just wonder if it would not be better to give also the number of significant events in those tables, as indicate the table captions.

Other comments:

- Explain better the terminology: primary, secondary, tertiary, and if it means anything besides an order of relevance.
- In your caveats about limitations, I think that the scarce number of turbines should also be mentioned.
- I suppose that figure 6 is an excedance histogram, similar to figure 4