

Review of WES 2022-23

Page 4: The procedure to account for unsteady polars in OpenFAST is not clear. Did the authors simulate separate cases for high, medium and low lift? How would this allow one to account for the unsteadiness in the flow in BEM simulations? Also, is unsteadiness in Cd considered?

L95-100: Authors used the chord to scale stiffness properties of the NREL 5MW as opposed to thickness. Since the blades are made of different airfoils, perhaps thickness could be considered for flapwise and chord for edgewise scaling? In any case, blade stiffness properties seem to me as indicative due to the scaling procedure. In my opinion this does not impact the validity of the study, but perhaps authors could consider stating this more clearly.

Figures 6,7 & following: Shaded areas are represented in these figures. It is not clear from the legend what these areas refer to. Are they the upper and lower ranges of Cl and Cd? Same consideration for Figure 9: did the author run different sets of simulations in OpenFAST with high, low and medium polar coefficients and then shade the areas accordingly?

P11: Could the authors please better explain why a pitch optimization was necessary as opposed to using SCADA data? SCADA data will report how the manufacturer intended the blade to operate. Therefore, if the spoilers are intended as a retrofit, they should be evaluated with respect to the operating "baseline" blade. Also, is the optimization performed for the blade with or without root spoilers? Finally, a comment on the pitch values resulting from the optimization would be nice, since they are somewhat hard to grasp from the figure.

Figure 8: number of markers on the x axis can be increased to improve readability

Figures 10 & 11: are tip losses accounted for? I would expect axial induction to go up at blade tip due to Pradt's tip loss correction and axial force to drop off.

Section 3.1.3: the decrease in root bending moment despite the increases in lift at root is interesting. How would the authors explain this? In a controller used in these simulations? Are there slight variations in rotor speed which would cause slight differences in forces in the outer parts of the blade (not appreciable in figure 11)? In other words, figure 11 seems to show an increase in axial force, while in figure 12 a decrease in rotor thrust is predicted, how can this be explained?

L210: "It is to be noted that, interestingly, the power gain of approximately 1% across the range of wind speeds is similar to the CL gain thanks to the spoiler presented in Figure 9." However looking at figure 13 this constant 1% seems reasonable only up to 8m/s

Table 4: It would be interesting to present values also as percentage respect to mean

Section 3.2.3: In the reviewer's opinion, fatigue results should be investigated more in depth. For instance it would be interesting to evaluate the impact on root bending moment and not only on the sectional stresses at root.