

Interactive comment on “Wind tunnel experiments on wind turbine wakes in yaw: Redefining the wake width” by Jannik Schottler et al.

Anonymous Referee #1

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The results in this paper, together with the companion paper, provide the results of a careful wind-tunnel experiment into wind turbine wakes in yaw. Additionally, this paper provides a novel analysis of velocity increments in the flow behind turbines, and how these are effected by yawing. The results and analysis are novel and provide a useful contribution to the literature. Overall the paper is well written with good supporting figures and analysis.

Comments:

Main comment is on the impact to loads. In the introduction, and later in the paper, references to past literature documenting that there is a connection between velocity increments and loads, but the nature of the connection is not elaborated on. Could some of the findings of those papers be summarized for context? For example, are the

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impacts more important for fatigue loads or extreme loads? In the companion paper, figure 11 shows a reduction in TKE during wake steering. If one is considering wake steering, to what extent would a reduction in TKE counter-balance a change in increment velocity? Is there a method to weigh these two changes? Is there a connection to loads on specific components (blades, drivetrain) or failure modes? Details in this regard would help to contextualize the findings.

Could the authors elaborate further on the connections to the companion paper. Would it make sense to bring the TKE analysis of the companion paper into this paper, and move the analysis of wake position to the companion paper? Feel free to reject this suggestion if I misunderstand the distinctions between the papers, My thinking is just that, for example, if only one of the papers dealt with estimating wake position, then this could make each of the papers more focused on specific effects. But, it would also be acceptable to further elaborate on the focus of the two papers, where they overlap and where they diverge.

Finally, the difference in rotation direction between the turbine models is very interesting. The authors use this difference to explain the asymmetries in vertical transport and tilt, could it also explain differences in displacement for positive vs negative yaw observed in the companion paper? Does the size of observed vortices vary with whether the vortex shed by misalignment is rotating in the same direction as the wake?

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