

Abstract Submitted
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Velocity-intermittency structure for wake flow of the pitched single wind turbine under different inflow conditions RYAN CRIST, RAUL BAYOAN CAL, NASEEM ALI, Portland State University, STANISLAV ROCKEL, JOACHIM PEINKE, MICHAEL HOELLING, University of Oldenburg — The velocity-intermittency quadrant method is used to characterize the flow structure of the wake flow in the boundary layer of a wind turbine array. Multifractal framework presents the intermittency as a pointwise Hlder exponent. A 3x3 wind turbine array tested experimentally provided a velocity signal at a 21x9 downstream location, measured via hot-wire anemometry. The results show a negative correlation between the velocity and the intermittency at the hub height and bottom tip, whereas the top tip regions show a positive correlation. Sweep and ejection based on the velocity and intermittency are dominant downstream from the rotor. The pointwise results reflect large-scale organization of the flow and velocity-intermittency events corresponding to a foreshortened recirculation region near the hub height and the bottom tip.

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