

Abstract Submitted  
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**Streamwise evolution of statistical events and the triple correlation in a model wind turbine array**<sup>1</sup> KYLE VIESTENZ, RAÚL BAYOÁN CAL, Portland State University — Hot-wire anemometry data, obtained from a wind tunnel experiment containing a  $3 \times 3$  wind turbine array, are used to conditionally average the Reynolds stresses. Nine profiles at the centerline behind the array are analyzed to characterize the turbulent velocity statistics of the wake flow. Quadrant analysis yields statistical events occurring in the wake of the wind farm, where quadrants 2 and 4 produce ejections and sweeps, respectively. A balance between these quadrants is expressed via the  $\Delta S_o$  parameter, which attains a maximum value at the bottom tip and changes sign near the top tip of the rotor. These are then associated to the triple correlation term present in the turbulent kinetic energy equation of the fluctuations. The development of these various quantities is assessed in light of wake remediation, energy transport and possess significance in closure models.

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