

Abstract Submitted
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Boundary layer development over a large array of porous-disk-modeled wind turbines via stereo particle image velocimetry ELIZABETH CAMP, VASANT VUPPULURI, RAÚL CAL, Portland State University — The increasing size of wind turbine arrays in service highlights the importance of understanding the flow physics within such large turbine arrays. Thus, the development of a wind turbine array boundary layer (WTBL) was investigated experimentally for an 8x5 array of model wind turbines. Model wind turbines were on a 1:2000 scale and turbine rotors were represented by porous disks. Stereoscopic Particle Image Velocimetry (SPIV) measurements were done along the centerline of the wind turbine array at several streamwise positions both within and above the canopy. Measurements and analysis of the mean and streamwise-averaged statistics of the SPIV fields focus on the rotors in the furthest downstream positions. Statistics will be used to determine if a fully developed WTBL has been achieved.

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