

Abstract Submitted  
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**Mean kinetic energy budget of wakes within an array of model wind turbines and porous discs** RAÚL BAYOÁN CAL, ELIZABETH CAMP, Portland State University — Wind turbines are often modeled as porous actuator discs within computational studies. In this wind tunnel study, stereo particle image velocimetry (SPIV) is used to characterize the wakes within a  $4 \times 3$  model wind turbine array and an analogous array of porous disks. The SPIV measurements are performed upstream between  $-2.9 \leq x/D \leq -0.3$  and downstream between  $0.7 \leq x/D \leq 5.6$  of the center turbine in the fourth row. To provide context, the similarities and differences in the flow fields as well as the mean and turbulent stresses are found. The primary analysis revolves around the mean kinetic energy budget in the wakes for both cases, model turbines and discs, obtained by the computation of mean kinetic energy, production of turbulence and flux of kinetic energy as these are equivalent to a measure of extracted power.

Elizabeth Camp  
Portland State University

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