Abstract Submitted
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Low order physical models of vertical axis wind turbines[1] ANNA CRAIG, JOHN DABIRI, JEFFREY KOSEFF, Stanford University — In order to examine the ability of low-order physical models of vertical axis wind turbines to accurately reproduce key flow characteristics, experiments were conducted on rotating turbine models, rotating solid cylinders, and stationary porous flat plates (of both uniform and non-uniform porosities). From examination of the patterns of mean flow, the wake turbulence spectra, and several quantitative metrics, it was concluded that the rotating cylinders represent a reasonably accurate analog for the rotating turbines. In contrast, from examination of the patterns of mean flow, it was found that the porous flat plates represent only a limited analog for rotating turbines (for the parameters examined). These findings have implications for both laboratory experiments and numerical simulations, which have previously used analogous low order models in order to reduce experimental/computational costs.

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