Abstract Submitted
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Numerical Perspectives on Wind Turbine Wakes[1] RUBEL DAS, SANG LEE, University of New Mexico — Rapid advances in high-fidelity simulations of wind farms have been feasible due to a recent establishment of advanced atmospheric boundary layer modeling capability coupled with wind turbine models that mimic the turbine wakes behind the rotor. The wake modeling is an essential component of wind farm simulation as it informs the researchers on the dynamics of the fluid physics within the wind farms and their implications on the wind farm performance in terms of power production and longevity. Actuator disk and line methods are the mainstream empirical models that represent the presence of a wind turbine which generate the associated downstream velocity deficit fields. While with proper modifications the power predictions are in close agreement with actual data, there is often a mismatch in fluid dynamic behavior in the wake deficit region which we attempt to identify the dominant causes and seek possible remedies.

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