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Evaluation of Wind Turbine Wake Interaction Models in a RANS Framework[1] JORDAN WILSON[2], KARAN VENAYAGAMOORTHY[3], Colorado State University — Wind energy produced from horizontal axis wind turbines (HAWTs) remains the most cost effective source of renewable energy production. Computational fluid dynamics (CFD) model studies are widely used as an *a priori* means to study wind farm environments for adequacy of wind resources and optimal configurations. This body of research explores the velocity deficit effect and flow fluctuations created by turbine wakes in a RANS framework for National Renewable Energy Laboratory (NREL) 5MW reference turbines. Various turbine models are explored to determine the most computationally efficient model that accurately captures the physics of interest. While only neutral ABL conditions are simulated in this study, consideration is also given to future work looking at the stable ABL and a full diurnal cycle when selecting a closure model. The objective of this current research is to further understand the development and resolution of turbine wakes for power optimization in neutral ABL conditions with a mind toward fatigue load minimization.

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