# Fluid-Structure Interaction Simulations of Multiple Wind Turbines in Atmospheric Boundary Layer Flows.

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This work focuses on fluid-structure interaction (FSI) simulations of multiple large-scale horizontal-axis wind turbines (HAWT) at full geometric and material complexities operating in atmospheric boundary layer (ABL) flows. The numerical formulation for stratified incompressible flows based on Variational Multiscale (VMS) techniques is coupled with Kirchhoff-Love thin-shell formulation, which is used to model main structural components of the wind turbines. The multi-domain method (MDM) is adopted to efficiently separate domains with rotating turbines where FSI simulations is performed from the domain that requires only aerodynamic simulations of the wake. The computational set-up is used to investigate the effect of atmospheric stability on a wake growth behind the turbine and wake-turbine interaction, specifically in terms of power losses and structural loading.

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