

Abstract Submitted  
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**Effect of helical-shape blades on the wake flow characteristics of vertical axis wind turbines.**<sup>1</sup> SHUOLIN XIAO, University of Houston, RONG-NAN YAO, University of Notre Dame, DANIEL ARAYA, Johns Hopkins University Applied Physics Laboratory, JOHN DABIRI, Stanford University, DI YANG, University of Houston — Vertical axis wind turbine (VAWT) is a widely used type of wind energy harvesting device. In recent years, considerable efforts have been devoted to studying the turbulent wake flow characteristics behind VAWTs. While most previous studies have focused on the VAWTs with straight blades, limited progress has been made for understanding the wake flow dynamics of VAWTs with helical-shape blades. In this study, the characteristics of turbulent wake flows behind helical-shape VAWTs are investigated both by wind tunnel experiments using the particle image velocimetry (PIV) technique and by large-eddy simulation (LES) using the actuator-line model (ALM). This talk presents the preliminary PIV and LES-ALM results for the wake behind a helical-shape VAWT and compares them to those for a straight-blade VAWT.

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