

Abstract Submitted  
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**Wind tunnel study of helical and straight-bladed vertical-axis wind turbine wakes** MARYAM BAGHERI, DANIEL ARAYA, University of Houston — It is hypothesized that blade curvature can serve as a passive means to control fluid entrainment and wake recovery in vertical-axis wind turbine (VAWT) arrays. We test this experimentally in a wind tunnel using two different VAWT configurations, one with straight blades and another with helical blades, keeping all other experimental parameters fixed. A small-scale, commercially available VAWT (15W max power) is used as the baseline wind tunnel model in each case. The commercial VAWT blades are replaced with either straight or helical blades that are 3D-printed extrusions of the same airfoil cross-section. Results from smoke flow visualization, three-component wake velocity measurements, and turbine power data are presented. These results give insight into the potential use of VAWTs with curved blades in utility-scale wind farms.

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