

Abstract Submitted
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Start-up dynamics of vertical axis turbines¹ KATHERINE TAYLOR,
JOHN DABIRI, Caltech — We present an experimental study of the self-starting
behavior of vertical axis turbines, in order to guide the design of systems that operate
in unsteady flows. The torque, angular velocity, and power generation of a scale
model turbine were measured in a free surface water tunnel for different starting
angles of the rotor blades and for different flow speeds. The starting behavior of the
turbine was found to be sensitively dependent on the initial angle of the rotor at
low flow speeds. A conceptual model was developed in order to explain the observed
behavior in terms of the instantaneous lift and drag on the rotor blades.

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