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## **AN OVERVIEW OF THE NREL/SNL FLEXIBLE TURBINE CHARACTERIZATION PROJECT<sup>\*†</sup>**

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### **ABSTRACT**

There has been a desire to increase the generating capacity of the latest generation of wind turbine designs. In order to achieve these larger capacities, the dimensions of the turbine rotors are also increasing significantly. These larger structures are often much more flexible than their smaller predecessors. This higher degree of structural flexibility has placed increased demands on available analytical models to accurately predict the dynamic response to turbulence excitation. In this paper we present an overview and our progress to date of a joint effort of the National Renewable Energy Laboratory (NREL) and the Sandia National Laboratory (SNL). In this paper we present an overview and status of an ongoing program to characterize and analytically model the dynamics associated with the operation of one of the most flexible turbine designs currently available, the Cannon Wind Eagle 300 (CWE-300). The effort includes extensive measurements involving a detailed inventory of the turbine's physical properties, establishing the turbine component and full-system vibrational modes, and documenting the dynamic deformations of the rotor system and support tower while in operation.

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