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Earl H Dowell* (earl.dowell@duke.edu), Box 90300, Duke University, Durham, NC 27708, and **Deman Tang** and **S Chad Gibbs**. *Nonlinear Self Excited Oscillations of a Cantilevered Flexible Plate in a Fluid Flow*.

Flexible structures may undergo self excited oscillation when exposed to the wind. Linear theory is usually adequate to predict the wind speed above which the oscillations may occur and also their frequency. However to predict the amplitude of the oscillations and thus the mechanical energy which may be transformed into electrical power, a nonlinear theory and computational model is required. Also the results must be verified by experiment. In addition such oscillations must occur for a range of wind directions.

In the presentation, the nonlinear oscillations of a flexible cantilevered plate will be discussed based upon a new nonlinear structural model and a linear potential flow aerodynamic model. A wide range of wind directions will be considered and the results of computations will be compared to those from wind tunnel experiments. (Received December 13, 2016)