

P. Chaviaropoulos, “*Flap Lead-leg Aeroelastic Stability of W/T Blade Sections*”, Journal Wind Energy, 2, 99-112 (1999).

Abstract

The scope of this paper is to investigate the aeroelastic stability of wind turbine blade sections subjected to combined flap-lead lag motion. The work is motivated by recent concern on destructive “edge-wise” vibrations of modern, half-megawatt scale, blades. The aeroelastic governing equations derive from the combination of a spring-mass-damper equivalent of the structure and a “non-stationary” aerodynamic model. The aerodynamic model used in the present context is the differential dynamic stall model developed at ONERA. The resulting equations of motion are linearized and their stability characteristics are investigated in terms of the system entries, expressed through suitable, non-dimensional, structural and aerodynamic parameters.

Keywords

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