

P.Chaviaropoulos, et. al, “ *Viscous and Aeroelastic Effects on Wind Turbine Blades. The VISCEL Project. Part II: Aeroelastic Stability Investigations*”, Journal Wind Energy, Vol 6, pp. 387-403, (2003).

Abstract

The recent introduction of ever-larger wind turbines poses new challenges with regard to understanding the mechanisms of unsteady flow-structure interaction. An important aspect of the problem is the aeroelastic stability of the wind turbine blades, especially in the case of combined flap/lead-lag vibrations in the stall regime. Given the limited experimental information available in this field, the use of CFD techniques and state-of-the-art viscous flow solvers provides an invaluable alternative towards the identification of the underlying physics and the development and validation of sound engineering-type aeroelastic models. Navier-Stokes-based aeroelastic stability analysis of individual blade sections subjected to combined pitch/flap or flap/lead-lag motion has been attempted by the present consortium, in the framework of the concluded VISCEL JOR3-CT98-0208 Joule III project.

Key words

Wind Turbines, Aeroelasticity, Aeroelastic Stability, Navier-Stokes Solvers