DYNAMIC STALL REGULATION OF THE DARRIEUS TURBINE

J. W. Oler, J. H. Strickland, B. J. Im, G. H. Graham
Texas Tech University; Lubbock, TX 79409

ABSTRACT

A two-dimensional unsteady airfoil analysis is described which utilizes
a doublet panel method to model the airfoil surface, an integral
boundary layer scheme to model the viscous attached flow, and discrete
vortices to model the detached boundary layers which form the airfoil
wake region. This model has successfully predicted steady lift and
drag coefficients as well as pressure distributions for several
airfoils with both attached and detached boundary layers. Unsteady
calculations have thus far been limited to attached flow situations.
Instantaneous pressure distributions have also been obtained on a
single-bladed rotor operating in a tow tank in order to provide
experimental data for eventual comparison with analytical predictions.