Title: Modeling Smart Wind Turbine Blades.

Abstract: The study investigates the effect of distributed suction on the dynamics of flow over the boundary layer of a wind turbine aerofoil of NACA 63-415 profile. Steady state, two-dimensional CFD calculations were performed for two different aerofoil configurations at Reynolds number of 4×106. The Navier-Stokes solver, ANSYS Fluent® was used to perform simulations and the results were obtained using the two-equation k-ω SST turbulence model. The solutions were computed for angles of attack ranging from 2 to 16 deg. to estimate its aerodynamic characteristics in terms of lift and drag coefficients. Results of this study show that distributed trailing edge suction has positive effect on the performance characteristics and the downstream wake profile.