

Maximization power coefficient of horizontal axis wind turbine blades (HAWT) using blade element momentum theory BEM

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Abstract: The horizontal axis wind turbine (HAWT) blade geometry with the diameter of 10.054 m using the S809 airfoil profile have been investigated numerically. The optimum blade shape, obtained using improved blade element momentum (BEM) theory. The main objectives are to predict the aerodynamic performances such as forces and torque imposed on the rotor blades, which are essential to its structure or design. This approach requires much less computing time and memory than three-dimensional simulation flow around the wind turbine rotor with simple CFD method. The flow is assumed unsteady, incompressible and fully turbulent.

Keywords: BEM method, CFD, aerodynamic performances, horizontal axis wind turbine

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