Dynamic Overset 2D CFD Numerical Simulation of a Small Vertical Axis Wind Turbine

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Abstract

The environment friendly sources of power have been explored due to increased deportment for environment. In this regard wind energy can be a doable option. A renewed involvement in vertical axis wind turbines was found. A wide variety of factors such as the cut-in, cut-out wind speed will decide the beneficence of horizontal axis wind turbines as a function of energy production and reliability. Also horizontal axis wind turbines have large blade operation space, low efficiency etc. In this work, 2D computational fluid analysis of an aggregate small type of vertical axis wind turbines is performed using pecuniary codes of GAMBIT 2.3 and FLUENT 6.3. At starting, the simulation model and numerical method of small type of vertical axis wind turbine is presented in detail having classical NACA0018, NACA0021 and NACA0025 three-bladed rotor. The result shows that NACA0025 bladed rotor has highest moment and power at higher tip speed ratio.

Keywords— *Vertical axis wind turbine; Computational fluid dynamics; Wind energy conversion; Aerodynamic; Tidal power*

Professional Biography

Dhruvin Shukla has completed his masters at the age of 25 years from Gujarat Technological University. He is the Adhoc assistant professor of Sarvajanik College of Engineering and Technology. He has published total of 4 papers in reputed journals and has been serving as a reviewer of repute.



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