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Performance analysis of a small capacity horizontal axis wind turbine using QBlade (Article)

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Abstract

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In recent times, wind energy has become one of the leading renewable energy sources for generating electricity in prospective regions around the globe. Nowadays, researchers are conducting different research activities to develop and optimize the existing designs of wind turbines through experimental and diversified computational techniques. Among the computational techniques, one of the popular choices is Computational Fluid Dynamics (CFD). However, CFD techniques are hardware intensive and computationally expensive. On the other hand, freely available simple tools like QBlade is computationally inexpensive and it can be used for performance and design analyses of horizontal and vertical axis wind turbines. In the present research, an attempt has been made to use QBlade for performance analyses of a smaller capacity horizontal axis wind turbine using selected prospective airfoils. In this study, four airfoils (namely, NACA 4412, SG6043, SD7062 and S833) have been selected and investigated in QBlade. It has been found that the overall power coefficients (CP) of NACA 4412 at different tip speed ratios are superior to the other three airfoils. © BEIESP.

SciVal Topic Prominence [📊](#)

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Author keywords

[Airfoil](#) [HAWT](#) [NACA 4412](#) [QBlade](#) [S833](#) [SD7062](#) [SG6043](#) [Wind Energy](#) [Wind Turbine](#)

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