

Abstract

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analysis of straight bladed vertical axis wind turbine

This work analyses the link between the geometry of a vertical-axis straight-bladed wind turbine and its performance (power coefficient). The geometry of a vertical-axis wind turbine cause Reynolds number variations. Any changes in the power coefficient which can also be studied to derive how its variation affect turbine performance. Using a calculation code based on the Double Multiple Stream Tube , symmetrical straight-bladed wind turbine performance was evaluated as for various solidity . This numerical analysis highlighted how turbine performance is strongly influenced by the Reynolds number of the rotor blade. Also A dimensional analysis is introduced and is to be considered to generalize the design for different turbine specifications. One of the qualities of dimensional analysis is that geometrically similar turbines will produce the same non-dimensional results. This allows one to make comparison between different size wind turbines in terms of power output and other related variables.