
Comparative Study between Direct Torque and Direct Power Control Schemes for a DFIG-Based Wind Turbine Generator

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This paper presents a comparative analysis of two control strategies applied in wind energy systems: direct torque control (DTC) and direct power control (DPC) of a Doubly-Fed Induction Generator. As the demand for renewable energy sources continues to soar, optimizing the efficiency of wind turbines is paramount. The study meticulously examines the advantages and performance characteristics of both control methods to shed light on their strengths and limitations. In the case of DTC applied to a DFIG, achieving minimal torque response time and eliminating the need for PI controllers prove advantageous when the DPC control strategy eliminates the necessity for rotor current control loops and PI controllers to control the stator active and reactive powers. Finally, the performance of the system is tested and compared by simulation in terms of robustness and pursuit tests based on Matlab/Simulink software.

Key words : Wind energy, Direct Torque control (DTC); doubly fed induction generator (DFIG); direct power control (DPC) .