

Improving the efficiency of a Doubly-Fed Induction Generator in variable speed wind turbines under different modes of operation considering core loss

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Abstract

This paper investigates improving the efficiency and the performance of Wind Energy Conversion Systems (WECS) equipped with Doubly Fed Induction Generator (DFIG). The main objective is to maximize the output power while minimizing the total copper loss simultaneously. This can be achieved using an analytical approach to determine the proper rotor current commands which give maximum mechanical power and minimum loss based on the measured generator speed. A hardware setup was constructed for validation of simulation results of maximum power point tracking and for further investigation of the change in the wind speed on the ability of the control system to respond to these changes with the proper control commands to obtain the maximum output power of the DFIG.

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