

Power Control of DFIG Driven by Matrix Converter Under Super and Sub Synchronous Operation Modes

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Abstract: In this paper, we present the modeling and control of the wind energy conversion systems based on the doubly fed induction generator fed by AC/AC matrix converter. Firstly, we developed the models of the different elements of the conversion chain. After, we consider the vector control strategy of the active and reactive powers in order to ensure an optimum operation. Finally, the dynamic model of a doubly fed induction generator and wind turbine grid connected system is determined in the d-q synchronous reference frame. Therefore, the powers control is verified using software Matlab/Simulink. The behaviours of the sub-synchronous and supersynchronous operation modes are presented and discussed. The results prove that the power control strategy is well adapted to this kind of system.

Keywords : wind systems, doubly fed induction generator, Bidirectional DC-DC Converter, Variable Speed Wind Turbine