

Application of Matrix Converter for the Power Control of a DFIG-Based Wind Turbine

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Abstract : This paper presents a control approach of the doubly fed induction generator (DFIG) in conjunction with a direct AC-AC matrix converter used in generating mode. This device is intended to be implemented in a variable speed wind energy conversion system connected to the grid. Firstly, we developed a model of matrix converter, controlled by the Venturini modulation technique. In order to control the power exchanged between the stator of the DFIG and the grid, a control law is synthesized using a high order sliding mode controller. The use of this method provides very satisfactory performance for the DFIG control. The overall strategy has been validated on a 2-MW wind turbine driven a DFIG using the Matlab/Simulink.

Keywords : doubly fed induction generator (DFIG), matrix converter, high-order sliding mode controller, wind energy

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