

Power Control of DFIG in WECS Using Backstipping and Sliding Mode Controller

Authors : Abdellah Boualouch, Ahmed Essadki, Tamou Nasser, Ali Boukhriss, Abdellatif Frigui

Abstract : This paper presents a power control for a Doubly Fed Induction Generator (DFIG) using in Wind Energy Conversion System (WECS) connected to the grid. The proposed control strategy employs two nonlinear controllers, Backstipping (BSC) and sliding-mode controller (SMC) scheme to directly calculate the required rotor control voltage so as to eliminate the instantaneous errors of active and reactive powers. In this paper the advantages of BSC and SMC are presented, the performance and robustness of this two controller's strategy are compared between them. First, we present a model of wind turbine and DFIG machine, then a synthesis of the controllers and their application in the DFIG power control. Simulation results on a 1.5MW grid-connected DFIG system are provided by MATLAB/Simulink.

Keywords : backstipping, DFIG, power control, sliding-mode, WESC

Conference Title : ICEE 2015 : International Conference on Electrical Engineering

Conference Location : Paris, France

Conference Dates : June 25-26, 2015