

Simulation of Wind Generator with Fixed Wind Turbine under Matlab-Simulink

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Abstract : The rapidly growing wind industry is highly expressing the need for education and training worldwide, particularly on the system level. Modelling and simulating wind generator system using Matlab-Simulink provides expert help in understanding wind systems engineering and system design. Working under Matlab-Simulink we present the integration of the developed WECS model with public electrical grid. A test of the calculated power and Cp related to the experimental equivalent data, using statistical analysis is performed. The statistical indicators of accuracy show better results of the presented method with RMSE: 21%, 22%, MBE : 0.77%, 0.12 % and MAE :3%, 4%. On the other hand we study its behavior when integrated in whole power system. Three level of wind speeds have been chosen: low with 5m/s as the mean value, medium with 8m/s as the mean value and high speed with 12m/s as the mean value. These allowed predicting and supervising the active power produced by the system, characterized respectively by the middle powers of -150 kW, -250kW and -480 kW which will be injected directly into the public electrical grid and the reactive power, characterized respectively by the middle powers of 60 kW, 180 kW and 320 kW and will be consumed by the wind generator.

Keywords : modelling, simulation, wind generator, fixed speed wind turbine, Matlab-Simulink

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