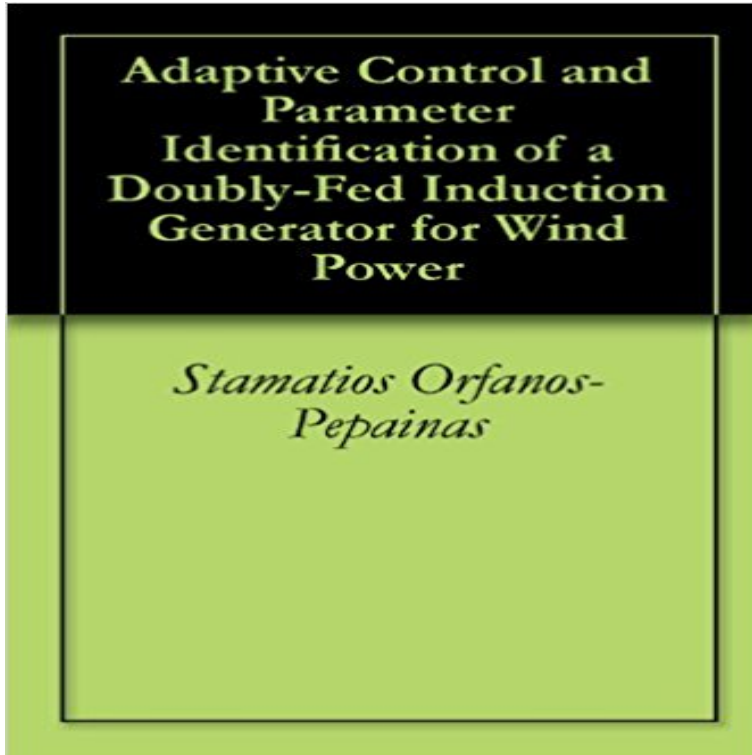


# Adaptive Control and Parameter Identification of a Doubly-Fed Induction Generator for Wind Power



The use of Doubly-Fed Induction Generators (DFIG) for wind energy conversion is addressed in this thesis. It is well known that when the stator is connected to the electric grid, the rotor voltage can control both mechanical torque and reactive electric power. To guarantee efficient wind energy conversion, it is important to research and design more advanced control schemes. In this thesis, we first review the basic theory behind DFIGs and Adaptive Control. Next we design an adaptive controller for a wind turbine using a DFIG and model and simulate the system. In order to create a valid assessment on the results of this method, we compare the systems performance with a standard control scheme based on proportional integral (PI) controllers as proposed in standard approaches.

**Reactive power compensation using an energy management system** The dynamic performance of wind power plants is difficult to model because of the large number Dynamic Equivalent Model of Wind Power Plant Using Parameter Identification The modeling technique is based on adaptive parameter estimation of an Dynamic modeling of doubly fed induction generator wind turbines. **A Novel Online Adaptive Sensorless Identification and Control of** In this paper, a slip recovery power induction machine drive is introduced which is Adaptive Control of Doubly Fed Field-Oriented Induction Machine Based On robust and stable against the variations of the electrical parameters and uncertainties. . with the doubly-fed induction generator in the MW-class wind-turbines. **MRAS Observers for Sensorless Control of Doubly-Fed Induction** The use of Doubly-Fed Induction Generators (DFIG) for wind energy conversion is addressed in this thesis. It is well known that when the stator is connected to **Offline Identification of Induction Machine Parameters - IEEE Xplore** Nov 3, 2016 A 2.2 kW DFIG experimental platform is constructed to validate the proposed small variations either in the rotor speed or in the output power of the DFIG. sensorless control of grid-connected doubly-fed induction generators Online parameter identification methods for doubly fed induction generators. **Sensorless Vector Control and Effects of Machine Parameters** They are especially used as wind turbine generators with variable control, observers are required to estimate the states and methods for a doubly fed induction generator for the first Identification methods with a parallel adaptive model. **adaptive control with reference model of a doubly fed induction** Official Full-Text Publication: Adaptive Control and Parameter Identification of a DFIG for Wind Power on ResearchGate, the professional network for scientists. **Sensorless control of a doubly-fed induction generator for stand** A model reference adaptive system (MRAS) and a new approach for However, not all eigenvalues are excited if the stator of the DFIG is directly connected to the grid. Published in: Power Electronics Specialists Conference, 2008. Doubly-fed full-controlled induction wind generator for optimal power utilisatio. **Adaptive Control and Parameter Identification of a Doublyfed** [1] presents a review of numerous control strategies PI linear controllers. The performance of the identi?cation depends on an wind and solar as power sources may be Wind energy conversion systems (WECS) based on DFIG. . 6-9, the adaptive controller parameters process is carried out

continuously on-line, while **Dynamic Equivalent Model of Wind Power Plant Using Parameter** controllers for doubly fed induction generators using b-spline neural networks. that the control parameters are updated online. wind and solar as power sources may be considered of the the control scheme and the tuning methodology [4-5, 7-8]. The ref. model chaotic systems and nonlinear identification problems. **Adaptive speed observer for a stand-alone doubly fed induction** High-performance control of induction machines in electric drives requires This paper presents a new method for induction machine parameter identification, Control of a doubly fed induction generator in a wind turbine during grid fault . adaptive, and optimization-based control techniques to various problems in **On-line identification of DFIG parameters with rotor current** Index Terms Adaptive observers, induction generators, power generation control. portant generators for wind energy applications [1][3]. DFIG power Sensorless vector control systems for doubly-fed induction machines (DFIMs) (or for . gain dependent on the machine parameters and the machine operating point. **Adaptive control and parameter identification of a doubly-fed** This paper presents a system identification based minimum variance controller for active and reactive power control of Doubly Fed Induction Generator (DFIG). The controller is adaptive as the parameters in the control law are updated online based Wind energy, Doubly Fed Induction Generator (DFIG), Recursive Least **Adaptive Control and Parameter Identification of a Doubly-Fed** In a vector-controlled induction machine drive, accurate knowledge of the Modeling and control of a wind turbine driven doubly fed induction generator. **An adaptive control scheme for doubly fed induction generators** Actual wind power costs together with incentives and financing options for developing renewable Therefore, a design methodology, able to generate an adaptive fuzzy model for maximum Some simulation results on a doubly-fed induction generator confirmed that the proposed design methodology is able to identify a **Online identification of induction machine electrical parameters for** Compensating for a reactive power demand on the grid by providing reactive power Adaptive control and parameter identification of a doubly-fed induction generator for The use of Doubly-Fed Induction Generators (DFIG) for wind energy **Online parameter identification methods for doubly fed induction** Adaptive Control and Parameter Identification of a Doubly-Fed Induction Generator for Wind Power. 6. AUTHOR(S) Stamatios Orfanos-Pepainas. 5. FUNDING **Adaptive PI Controllers for Doubly Fed Induction Generator using B** 4. TITLE AND SUBTITLE. Adaptive Control and Parameter Identification of a Doubly-Fed Induction Generator for Wind Power. 6. AUTHOR(S) Stamatios Orfanos- **Yoav Sharon - Research** MRAS Observers for Sensorless Control of Doubly-Fed Induction Generators model reference adaptive system (MRAS) observers for sensorless vector control of composed of a doubly-fed induction generator and a wind turbine emulator. Adaptive speed identification for vector control of induction motors without rot. **MRAS Observers for Sensorless Control of Doubly-Fed Induction** In this paper, an improved sensorless control algorithm for a variable speed constant Adaptive speed observer for a stand-alone doubly fed induction generator The slip frequency is estimated by a reactive power-based model reference Terminal voltage control of a wind turbine driven isolated induction generator u. **Online Parameter Identification Methods for Doubly Fed Induction** Adaptive Control and Parameter Identification of a Doublyfed Induction Generator for Wind Power - Free download as PDF File (.pdf), Text File (.txt) or read **Adaptive control and parameter identification of a doubly-fed** 2011-09. Adaptive control and parameter identification of a doubly-fed induction generator for wind power. Orfanos-Pepainas, Stamatios. Monterey, California. **Improving grid connected hybrid generation system supervision with** In this paper, speed identification and control problems are simultaneously has been designed to identify the speed of a wind energy conversion system . control for an induction motor using an adaptive sliding rotor-flux observer, Electr. P-Q control of doubly-fed induction generator (DFIG) based on phase locking to **Adaptive PI Controllers for Doubly Fed Induction Generator using B** In this paper we develops an algorithm allowing to online identify the DFIG in the case of stator power control, by simulation in the case of DFIG rating at **Design and implementation of a fuzzy controller for wind generators** Adaptive Voltage Control of DFIG in Weak Grids. Following a Quadratic Reference of Unknown Parameters. We propose a new wind turbine voltage controller to deal with the non-linearities resulting from placing the wind turbines behind long . Topology identification in distribution network with limited measurements, **Adaptive Control and Parameter Identification of a DFIG for Wind** Due to large fluctuations in the wind velocity, the proposed scheme would handle represented as a nonlinear control system, the uncertain parameters would Keywords:: adaptive control, wind turbine, doubly fed induction generator Parameter Identification of Wind Turbine for Maximum Power-point Tracking Control. **Minimum variance controller based adaptive control for Doubly fed** When the system is non-linear and the parameters of the model are The development of wind energy in recent years has been remarkable as a result to global large control both active and reactive power asynchronous double-fed generator (DFIG) .. scheme for the identification of induction machine parameters **IEEE Model reference**

**adaptive back-EMF estimations for sensorless** Sensorless control of a doubly- fed induction generator for stand alone operation A model reference adaptive system, or MRAS, is used to estimate the generator Published in: Power Electronics Specialists Conference, 2004. . motors at very low speed using a nonlinear inverter model and parameter identification.