

The results are indicative to achieve better performance when the working temperature tends to be around 70-80°C, with lower gas flow, less than 120 mL/min H<sub>2</sub>. The humidifying temperature seemed to have no greater influence in the experimented range.

Keywords: PEMFC, hydrogen, fuel cell

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ENERGY QUALITY OF DISTRIBUTED GENERATION WITH PV GRID-CONNECTED SYSTEMS AT USP:  
Evaluation of supply parameters

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The paper present results obtained from the evaluation of the parameters regarding energy quality, supplied by the 0.5 kW grid connect PV system installed in the building administration of the Electrotechnical and Energy Institute of São Paulo

The results obtained show the need to perform systematic studies to get experience and background to work with the distributed generation systems connected to the grid

Keywords: Distributed Generation, Operation Characteristics, Active and Reactive Power

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PROPOSAL TO THE PERFORMANCE OF PHOTOVOLTAIC SYSTEMS CONNECTED TO THE UTILITY POWER GRID

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Among the energy forms used to substitute the conventional electricity generation methods, the photovoltaic solar conversion is one of the most interesting alternative. In fact, this option may be justified because of some advantages such as lower losses, higher efficiency and longer useful lifetime than others similar energy sources. However, the operation of such system must be optimized in order to make it even more competitive. Within this context, this work aims to develop a control equipment to search for the maximum power operation of a photovoltaic system connected to the power grid. PWM (Pulse Width Modulation) technique is used to adjust the DC side voltage to the point of maximum power absorbed by the AC system, minimizing the operation of the photovoltaic generator at any sunstroke level. Some results are shown to confirm its efficacy of the proposed solution.

Keywords: Photovoltaic Solar Energy, Distributed Generation, PWM Inverter

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OPTIMIZATION STUDIES ON PEM FUEL CELL USING RESPONSE SURFACE METHODOLOGY

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*A development of a new process for Membrane Electrode Assembly (MEA) production of PEM Fuel Cell aiming cost reduction and innovation has been conducted at IPEN (Instituto de Pesquisas Energéticas e Nucleares) in São Paulo, Brazil. This process comprises a spray technique for the catalyst ink layer application followed by a hot press procedure. Water was chosen as solvent for the catalyst ink preparation, simplifying the method. The data were treated electronically by statistical software and the response surfaces were obtained, showing optimized results for this specific PEMFC. A statistical study (Taguchi-Burman factorial design) of the main process parameters such as spray air pressure, spray distance, membrane temperature by spraying, membrane drying time, press temperature, press pressure and press time has been made. The process parameters were evaluated using EIS (Electrochemical Impedance Spectroscopy) and polarization curves (current densities x cell voltage).*

Keywords: fuel cell, membrane electrode assembly, gas diffusion electrode, catalyst ink, hot press.

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#### A METHODOLOGY FOR VOLTAGE STABILITY ASSESSMENT IN DISTRIBUTION NETWORKS WITH WIND GENERATION

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*This work investigates voltage stability problems in a distribution power system with wind generation (induction machines) using a methodology that combines steady state and time domain computer simulation. The steady state analysis applies sensitivity indices in order to identify the operation conditions and the buses subject to voltage problems, and indicates the proper system bus where the wind farm must be installed. Time domain analysis is used to verify the generator and the distribution system dynamic responses to network disturbances, and verify the system robustness in terms of voltage stability based on sensitivity indices.*

Keywords: wind generation, voltage stability, sensitivity analysis, time domain.

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#### EFFECTS OF IRRADIANCE ATTENUATORS ON THE TESTING OF PHOTOVOLTAIC DEVICES

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*The purpose of this work is to validate the use of black polyethylene shading nettings as irradiance attenuators on the testing of photovoltaic devices using the Sun as light source. An experiment was carried out in order to check if any potential spatial non-uniformities and temporal instability on the solar irradiance caused by the netting could distort I-V curves of photovoltaic devices. I-V curves of an encapsulated photovoltaic cell were traced under several conditions, under direct sunlight and covered by the net at different distances. Two types of shading nets were tested. The nets were stretched on wooden frames*