

Optimum Design of Photovoltaic Water Pumping System Application

Authors : Sarah Abdourraziq, Rachid El Bachtiri

Abstract : The solar power source for pumping water is one of the most promising areas in photovoltaic applications. The implementation of these systems allows to protect the environment and reduce the CO₂ gas emission compared to systems trained by diesel generators. This paper presents a comparative study between the photovoltaic pumping system driven by DC motor, and AC motor to define the optimum design of this application. The studied system consists of PV array, DC-DC Boost Converter, inverter, motor-pump set and storage tank. The comparison was carried out to define the characteristics and the performance of each system. Each subsystem is modeled in order to simulate the whole system in MATLAB/ Simulink. The results show the efficiency of the proposed technique.

Keywords : photovoltaic water pumping system, DC motor-pump, AC motor-pump, DC-DC boost converter

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