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Application of the Direct Power Control Strategy in a Shunt Active Filter by Exploiting the Solar Photovoltaic Energy as a Continuous Source

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Abstract: In order to follow the standard recommendations of the electrical energy quality (IEEE519) on the distribution network, the active filters have responded to these recommendations, which require that the Total Harmonic Distortion (THD) must be less than 5%. The purpose of this paper is to improve the waveform of the electric current that is distorted due to the non-linear load by the shunt active filtering system by exploiting photovoltaic solar energy as a source of the continuous bus of the inverter and obtain a waveform of the sinusoidal source current with a THD in accordance with the recommendations cited above. To show what we have said, we used a SAPF powered by a PV system (module type MSX120 and a DC-DC boost converter controlled by the (P and O) method) controlled by the Direct Power Control (DPC) technique. The simulation results under $MATLAB/Simulink$ showed us the effectiveness of the proposed system.

Keywords: *direct power control (DPC); perturbation and observation (P and O); photovoltaic solar system; shunt active power filter (SAPF).*

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