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On the Optimization of a Decentralized Photovoltaic System

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Abstract : In this paper, we present a grid-tied photovoltaic system. The studied topology is structured around a seven-level inverter, supplying a non-linear load. A three-stage step-up DC/DC converter ensures DC-link balancing. The presented system allows the extraction of all the available photovoltaic power. This extracted energy feeds the local load; the surplus energy is injected into the electrical network. During poor weather conditions, where the photovoltaic panels cannot meet the energy needs of the load, the missing power is supplied by the electrical network. At the common connexion point, the network current shows excellent spectral performances.

Keywords : seven-level inverter, multi-level DC/DC converter, photovoltaic, non-linear load
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