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Maximum Power Point Tracking Based on Estimated Power for PV Energy Conversion System

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Abstract : In this paper, a method for maximum power point tracking of a photovoltaic energy conversion system is presented. This method is based on using the difference between the power from the solar panel and an estimated power value to control the DC-DC converter of the photovoltaic system. The difference is continuously compared with a preset error permitted value. If the power difference is more than the error, the estimated power is multiplied by a factor and the operation is repeated until the difference is less or equal to the threshold error. The difference in power will be used to trigger a DC-DC boost converter in order to raise the voltage to where the maximum power point is achieved. The proposed method was experimentally verified through a PV energy conversion system driven by the OPAL-RT real time controller. The method was tested on varying radiation conditions and load requirements, and the Photovoltaic Panel was operated at its maximum power in different conditions of irradiation.

Keywords : control system, error, solar panel, MPPT tracking
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