



Comparative Analysis of Maximum Power Point Controlling Techniques for Stand Alone PV System

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Abstract – The photovoltaic systems used in the decentralized production of electric energy have undergone significant expansion during the last decade. On the other hand, there are two main shortcomings of PV system, namely the low conversion efficiency of PV modules and the high installation cost for the same. Moreover, the PV system shows nonlinear characteristics that depends on weather conditions.

In this paper, standalone PV system is analyzed with different Maximum Power Point controlling techniques i.e. Perturb and Observe, Incremental Conductance & Fuzzy Logic Control, to study various parameters like settling time, oscillation around maximum power point and selection criteria of DC-DC converter. The PV array's output is supplied to the load after being conditioned by DC-DC boost converter.

The maximum power point tracking is essentially a load matching problem. When the load at converter end is fixed and the duty cycle of the converter is varied which in turns varies the effective load on the PV system, there by changing the slope of the load line and shifting the operating point and fixing it at the MPP, maximum power can be accomplished from the PV array. Selection criteria of DC-DC converter is important because DC-DC converter decides tracking and non-tracking region which is discussed in detail.

Keywords –DC-DC converter, Fuzzy Logic Control, Incremental Conductance, MPPT, Perturb and Observe, PV array.