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An Adaptive Voltage Sensor Based MPPT for Photovoltaic System with Sepic Converter Including Steady State and Drift Analysis

Vikrant P. Moon[1] and Vishal M. Pimpalkar[2]
Post Graduate Student[1] and Assistant Professor[2]
Ballarpur Institute of Technology, Bamani, Chandrapur, Maharashtra, India
vikrantmoon123@gmail.com and vishalpimpalkar7@gmail.com

Abstract: *Solar energy is the most important and freely available energy source which generate DC power. High DC/ DC conversion and Maximum Power Point Tracking (MPPT) control are essential component in Photovoltaic (PV) system. An adaptive voltage sensor based MPPT algorithm employing a variable scaling factor for a Single Ended Primary Inductance converter (SEPIC) is presented. In these method, only a voltage divider circuit is used to sense the PV panel voltage. It can effectively improve both transient and steady state performance [2] varying the scaling factor as compared to the fixed step size and adaptive step size with fixed scaling factor for sudden change in solar insolation or in start-up, these method leads to faster tracking while in steady state it leads to lower oscillation around Maximum Power Point (MPP). To determine the tracking efficiency steady state behaviour and drift phenomenon also given in these paper. To simplify the control circuits duty cycle is generated without using any proportionate integral control loops for simplicity. MATLAB/Simulink is used as a digital platform to implement the proposed algorithm for experimental validation.*

Keywords: Photovoltaic (PV), voltage sensor, maximum power point tracking (MPPT), adaptive, drift phenomena, scaling factor, duty cycle and single ended primary inductance converter (SEPIC).

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