UNIVERSITY of HOUSTON
CULLEN COLLEGE of ENGINEERING
Department of Electrical & Computer Engineering

MS Thesis Announcement

A MPPT Technique for Single-Phase Photovoltaic Systems with Reduced DC-Link Capacitor

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This thesis proposes an approach for reducing the capacitance requirement of the Power Conditioning Unit (PCU) for Photovoltaic (PV) Systems. The DC-Link capacitor acts as a power-decoupling device, required for connecting any DC source to AC grid. Electrolytic capacitors used in the conventional PCUs are detrimental to the reliability of the PV unit. If the capacitance requirement of the PCU is considerably limited, then film capacitors can be employed without any additional cost as they offer better reliability and last longer.

The DC-link capacitor size reduction is facilitated by allowing dc-link voltage to have specified amount of ripple content. However, in two-stage PCU topology, a high dc-link voltage ripple imposes double-line-frequency ripple in the PV panel voltage. This leads to oscillations in the panel power and thereby resulting in the power loss. In view of this, this thesis develops an MPP Locus Line based Maximum Power Point Tracking (MPPT) control algorithm to mitigate the ripple in the PV voltage. The proposed digital control algorithm was simulated in MATLAB Simulink and implemented in a laboratory prototype using Digital Signal Processing (DSP)-based Microcontroller, TMS320F28035.

Committee Chair:	Dr. Wajiha Shireen	Place: T2 323
Committee Members:	Dr. Yuhua Chen	Date: 11/12/2012
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