

Model Predictive Control of Three Phase Inverter for PV Systems

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Abstract : This paper presents a model predictive control (MPC) of a utility interactive three phase inverter (TPI) for a photovoltaic (PV) system at commercial level. The proposed model uses phase locked loop (PLL) to synchronize TPI with the power electric grid (PEG) and performs MPC control in a dq reference frame. TPI model consists of boost converter (BC), maximum power point tracking (MPPT) control, and a three leg voltage source inverter (VSI). Operational model of VSI is used to synthesize sinusoidal current and track the reference. Model is validated using a 35.7 kW PV system in Matlab/Simulink. Implementation and results show simplicity and accuracy, as well as reliability of the model.

Keywords : model predictive control, three phase voltage source inverter, PV system, Matlab/simulink

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