

Abstract

Mostafa Ahmed Abdel Galil

Power Quality Improvement of Single-Phase Grid-Connected PV System with Fuzzy MPPT Controller

Photovoltaic (PV) systems are grid-connected via an interfacing converter which operates with Maximum Power Point Tracking (MPPT) controller in order to feed the grid by the maximum allowable solar power. Nonlinear loads affect the system power quality. Conventionally single-phase shunt active power filter (APF) can be used to improve the power quality in terms of current harmonics mitigation and reactive power compensation. In this paper, the PV interfacing inverter is controlled using a predictive control technique to perform both functions of power quality improvement in addition to transferring the PV maximum power to the grid. A Fuzzy logic control algorithm is applied for MPPT. The proposed technique does not require an accurate system model and can easily handle system nonlinearity. The system performance is investigated using a MATLAB simulation model.