

# **Particle swarm optimization based maximum power point tracking for Partially Shaded Photovoltaic Arrays**

## **Abstract**

This paper presents particle swarm optimization based perturb and observe (PSO-P&O) algorithm for maximizing output power of photovoltaic (PV) array under partially shaded conditions (PSC). During PSC, the P-V characteristic of PV will become more complex with multiple maximum power points (MPP). Most of the conventional maximum power point tracking (MPPT) algorithms, such as P&O, will be trapped at the local MPP and hence limiting the maximum power generation. As such, investigation on PSO-P&O algorithm is carried out to maximize the PV generated power principally under PSC operation. The performances of conventional P&O and the proposed PSO-P&O algorithms are investigated particularly on the transient and steady state responses under various shaded conditions. The simulation results show the developed PSO- P&O algorithm is able to facilitate the PV array to reach the global MPP and assist the PV array to produce more stable output power compared to the conventional P&O algorithm.