Abstract

The Partial Shadowing (PS) is one of the hotspot topics and one of the significant challenges in the Photovoltaic (PV) systems. The PS of PV modules cause serious energy loss of the PV energy. It is observed (using detailed simulation MATLAB programs) that, The PS effect is clear on both of I-V & P-V output characteristics (Ch/s) curves. Also, it is observed that, the energy loss due to PS when no diode is used is significantly large. But when the diodes are used, the energy loss decreases appreciably. The saving in energy loss increases as the number of diodes per module increases. It is proposed here to increase the number of diodes per each group of solar cells results in saving of energy loss. This Paper shows the recommended number of bypass diodes (Internal or External) solution to reduce the energy loss. The internal solution by increasing of diodes number per module, while the external solution by increasing of diodes number per group. This paper also discusses the effect of increasing the operating voltage of the system on PS loss.
A Proposed Solution for Partial Shadowing

- Jianbo Bai, Yang Cao, Yuzhe Hao, Zhen Zhang, Sheng Liu and Fei Cao. 2015,"Characteristic output of PV systems under partial shading or mismatch conditions"; Solar Energy 112 41–54.

Index Terms

Computer Science
Pattern Recognition
Keywords
- Photovoltaic (PV) System
- Energy Loss
- Partial Shadowing (PS)
- Partial Shading
- Shadowing Effect
- Shadows
- Array Configurations
- Bypass Diode
- Blocking Diode
- Modeling and Simulation.