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Authors:

C. Saravanan

M. A. Panneerselvam

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Abstract

This paper proposes an improved model approach to single diode PV model by Hybrid Genetic Algorithm Particle Swarm Optimization (Hybrid GA-PSO) technique. The main objective is to extract accurate parameters of PV model for the simulator developers which could help them to develop an enhanced PV model in Matlab/Simulink environment. Specifications provided by the manufacturer's data sheet of PV module have been used for the computation of model parameters. Hybrid approach of GA and PSO is purposely chosen to utilize their effectiveness in these kinds of applications. This method is used to optimize the parameters I_{pv} , a , R_{se} and R_{sh} with their best optimal values. For the confirmation of accuracy and computational time of the proposed method, poly-crystalline PV module (KL070) has been selected and the best optimal value of each parameter has been obtained using Hybrid GA-PSO. Finally, the extracted values have been used in the single diode PV model and tested for various irradiances and temperatures. The proposed methodology results in marked improvement and can be a tool for simulator developers who require absolute and accurate model.

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Index Terms

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Keywords

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