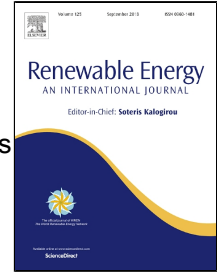


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New method for computing single diode model parameters of photovoltaic modules

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1 New method for computing single diode model parameters of photovoltaic modules

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6 **Abstract:** The objective of this paper is to calculate the single diode model parameters
7 (A , R_s , R_{sh} , I_L , and I_0) of photovoltaic modules in most straightforward way no using
8 iterative techniques and an additional information of pre-measured/digitized current-
9 voltage curves. For that purpose, a new method based on solely datasheet information is
10 introduced. The novelty of this method is to use a dark saturation current as an initial
11 parameter as calculating the single diode model parameters. The effectiveness of
12 proposed was validated using current-voltage curves of five commercially available
13 photovoltaic modules at standard test conditions. The current-voltage curves were
14 simulated using the proposed method and compared with datasheet supplied current-
15 voltage curves by means of a root means square error tool. It has been founded that the
16 new method, which proposes a very simple calculation procedure to obtain the single
17 diode model parameters, meets international standards as simulating current-voltage
18 curves of photovoltaic modules.

19
20 **Key words:** photovoltaic, single diode model parameters, current-voltage curve

21 1. Introduction

22 Photovoltaic (PV) users need to know the current-voltage (I-V) curve of PV module that
23 they have, in order to assess its electrical performance; the output peak power (P_M),
24 efficiency (η), fill factor (FF) and produced electricity (E) for defined period. The

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