

Optimize Configuration For Mismatched PV System

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Abstract—Power generation efficiency of Photovoltaic(PV) system are significantly affected by partial shading and solar cell damage. This efficiency loss caused by turning on bypass diode of PV panels, which we called mismatch loss. By using some reconfiguration technology to reconfigure electrical series or parallel connection can reduce the mismatch loss and maximize power generation. Recently, an efficient reconfiguration method is proposed. This method applies precise power simulations based on a list of configuration candidates. However, some of the configuration candidates are not be able to realized and this method does not show any systematic way to identify such feasibility. Thus, in this paper we propose a very fast algorithm to check feasibility and reduce wiring complexity.

I. INTRODUCTION

With fossil depleting and the pollution of the environment becomes more serious. Green and renewable energy have become necessary for a sustainable society and environment. Photovoltaic(PV) receive significant attention since it has unlimited energy and can be easily scaled up. However, due to the nature of photovoltaic cell structure, PV arrays are sensitive to partial shading and PV cell fault or aging. That means when PV cells or modules experience different irradiance or do not uniformly generate power, the PV array is mismatched and unable to efficiently generate power. Additionally, when PV array under mismatch condition it will accelerate aging and heating for PV cells. That will cause a short circuit of PV array for further damaging. In order to prevent damaging on PV array and maximize power generation many reconfiguration method been proposed. The work in [?] proposed a switch matrix to reconfigure shadowed PV array, but it can not be able to apply on large size PV array. Paper [?] using “irradiance level equation” method to dynamic reconfigure PV array and improve power generation efficiency over 10%.

In this paper, we use un-uniform irradiance distribution to represent the mismatch condition that PV array experienced.

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- In American English, commas, semicolons, periods, question and exclamation marks are located within quotation marks only when a complete thought or name is cited, such as a title or full quotation. When quotation marks are used, instead of a bold or italic typeface, to highlight a word or phrase, punctuation should appear outside of the quotation marks. A parenthetical phrase or statement at the end of a sentence is punctuated outside of the closing parenthesis (like this). (A parenthetical sentence is punctuated within the parentheses.)
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- There is no period after the “et” in the Latin abbreviation “et al.”.
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An excellent style manual for science writers is [?].

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to apply a style (in this case, italic) in addition to the style provided by the drop down menu to differentiate the head from the text.

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TABLE I
TABLE TYPE STYLES

Table Head	Table Column Head		
	<i>Table column subhead</i>	<i>Subhead</i>	<i>Subhead</i>
copy	More table copy ^a		

^aSample of a Table footnote.



Fig. 1. Example of a figure caption.

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quantities and units. For example, write “Temperature (K)”, not “Temperature/K”.

ACKNOWLEDGMENT

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REFERENCES

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