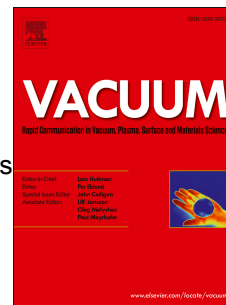


Accepted Manuscript

Performance of photovoltaic cells in different segments of spatial-spectral distributions

Prashant K. Sarswat, M. Jagannathan, Michael L. Free



PII: S0042-207X(17)30103-3

DOI: [10.1016/j.vacuum.2017.03.034](https://doi.org/10.1016/j.vacuum.2017.03.034)

Reference: VAC 7357

To appear in: *Vacuum*

Received Date: 21 January 2017

Revised Date: 20 March 2017

Accepted Date: 28 March 2017

Please cite this article as: Sarswat PK, Jagannathan M, Free ML, Performance of photovoltaic cells in different segments of spatial-spectral distributions, *Vacuum* (2017), doi: 10.1016/j.vacuum.2017.03.034.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Performance of photovoltaic cells in different segments of spatial-spectral distributionsPrashant K Sarswat,^{1,*} M. Jagannathan,¹ and Michael L Free¹¹ *Department of Metallurgical Engineering, University of Utah, Salt Lake City, Utah, 84112, USA*

In a single-bandgap solar cell, efficiency is limited by the inability to efficiently convert the broad range of energy that photons possess in the solar spectrum. One of the effective ways of enhancing the efficiency of solar cells is to split the broad solar spectrum into smaller energy ranges and to utilize each range with a photovoltaic (PV) cell of the appropriately tuned bandgap. The conventional approach to implementing this idea is to use stacks of PV cells sequentially placed in the order of increasing bandgap energy, with the highest bandgap cell at the top. Lateral spectrum splitting can avoid many of the disadvantages of this conventional approach. We demonstrate that spectrum splitting with a prism and a lens can achieve enhanced efficiency with a combination of GaAs and c-Si solar cells.

PACS: 42.15.Eq, 07.60.-j, 07.60.Rd, 88.40.hj

*Author to whom correspondence should be addressed; E-mail: saraswatp@gmail.com, Tel: +1-801-520-6919, Address: 135 S, 1460 E, Room 412, Salt Lake city, UT 84112.

Download English Version:

<https://daneshyari.com/en/article/8044793>

Download Persian Version:

<https://daneshyari.com/article/8044793>

[Daneshyari.com](https://daneshyari.com)