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Analysis of photo-response of a back contact silicon solar cell under spot illumination

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Abstract content
   (Max 300 words)
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Photovoltaic (PV) devices characterisation involves extraction of performance and device parameters from current-voltage (I-V) characteristics obtained under specific conditions. However, under outdoor conditions, solar cells are exposed to varying conditions such as changing intensity and spectral content which affects the I-V characteristics and performance of the device. In this study, a back contact silicon solar cell was spot illuminated using 445nm and 785nm wavelength lasers with a spot size of ˜ 200µm. Current and voltage values at different laser power outputs ranging from 0 to 45mW were acquired while carrying out light beam induced current (LBIC) measurements from which I-V characteristics were obtained. A curve fitting algorithm based on the single diode model was applied to extract device and performance parameters. The results obtained were used to study the photo-response of the device when subjected to very narrow spectral range at different wavelengths and changing illumination intensity. This paper discusses the effect of changing spectral content and illumination intensity on the device and performance parameters of a spot illuminated back contact silicon solar cell.

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PhD

Main supervisor (name and email)
and his / her institution

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Yes

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