



Contribution ID: 337

Type: **Poster Presentation**

Measuring current – voltage characteristics of photovoltaic cells and module at various wavelengths

Thursday, 12 July 2012 17:30 (2 hours)

Abstract content
 (Max 300 words)

A Solar cell is a semiconductor device consisting of a p-n junction diode, which is capable of generating usable electricity from sunlight. Light travels in the form of an electromagnetic wave and the amount of energy contained in the photons is dependent on the wavelength of the electromagnetic wave. It becomes necessary to determine at what wavelength solar cells will generate electricity more efficiently. Traditionally, the spectral response of solar cells has been measured by indirectly measuring the current generated at various wavelengths. Normally this suffices for single junction solar cell materials. With the production of hetero-junction solar cells the effect of spectrum is no longer a negligible parameter. Furthermore, multi-junction solar cells have very distinctive characteristics at various wavelengths. The objective of this study is therefore to measure these characteristics at various wavelengths by measuring the full I-V characteristics at wavelengths ranging from 300nm – 1200nm. For this purpose a current and voltage measurement system was designed and constructed. This system is capable of measuring currents and voltages in the micro-range and can also be used to measure dark I-V characteristics and capacitance-voltage characteristics (C-V). The final paper will present the measurement system and preliminary results of I-V, dark I-V and C-V characteristics of various photovoltaic technologies.

Apply to be
 consider for a student
 award (Yes / No)?

yes

Level for award
 (Hons, MSc,
 PhD)?

MSc

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

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Would you like to
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yes

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Session Classification: Poster Session

Track Classification: Track F - Applied Physics