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## Effect of spectral changes on I-V parameters of triple junction solar cells

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### Abstract content <br> &nbsp; (Max 300 words)

Characterisation of multi-junction solar cells presents more challenges compared to single junction solar cells due to the series connection of multiple subcells. In monolithically integrated solar cells, the subcells are epitaxially grown and internally connected through tunnel junctions. As a result of series connection of the subcells, the current from the solar cell device is determined by the subcell producing the lowest current. Each of the subcells in the multi-junction solar cell is optimised to absorb a given range of wavelengths of the solar spectrum. However, changes in the spectral content of the incident beam may lead to changes in the photogenerated current from the subcells leading to current mismatch. This will affect the current-voltage (I-V) characteristics, the operating voltage and performance of the multi-junction solar cell device. It is therefore important to investigate the effect of the spectral content on the device and performance parameters of multi-junction solar cells. In this study, current and voltage values were obtained while simultaneously carrying out light beam induced current (LBIC) measurements on an InGaP/InGaAs/Ge triple junction solar cell under different spectral conditions to obtain point illuminated I-V characteristics. A curve fitting algorithm was then applied to obtain I-V parameter maps under different spectral conditions from which changes in device and performance parameters due to changes in the spectral content of the beam probe were studied. This paper will discuss the impact on device and performance parameters of InGaP/InGaAs/Ge triple junction solar cell due to changes in the spectral content of the beam probe illuminating the solar cell device

### Apply to be<br> considered for a student <br> &nbsp; award (Yes / No)?

Yes

### Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD)?

PhD

### Main supervisor (name and email)<br>and his / her institution

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### Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?

Yes

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