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Electroluminescence Module Mismatch Analysis (EMMA)

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Electroluminescence (EL) imaging has been utilised in qualitative characterisation of photovoltaics devices since 2005. It has been utilised quantitatively to determine individual cell voltages, as well as individual cell electrical parameters. However, there has been limited work on the development of an analysis technique that combines both the individual cell voltages as well as the local opto-electric properties of each cell. In this study a technique is proposed so as to allow for the study of module mismatch, module degradation and the effect of degradation on module mismatch.

Electroluminescence Module Mismatch Analysis (EMMA) makes use of voltage-dependent EL imaging to determine a set of operational voltage mismatch indices. These indices can then be used to give an estimated power response of a module under different irradiance conditions. This paper presents the development of EMMA as a tool to assess PV modules on a commercial scale utilising the third generation MBJ Mobile Lab.

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

Yes

Level for award (Hons, MSc, PhD, N/A)?

PhD

Primary author: Mr DIX-PEEK, Ross (NMMU)

Co-authors: Ms STINDT, Carmen (Nelson Mandela University); Prof. VAN DYK, Ernest (Mandela University); Dr VORSTER, Frederik (NMMU)

Presenter: Mr DIX-PEEK, Ross (NMMU)

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