Proposing a model to investigate the impact of interconnection technology on shading damage by TFPV modules

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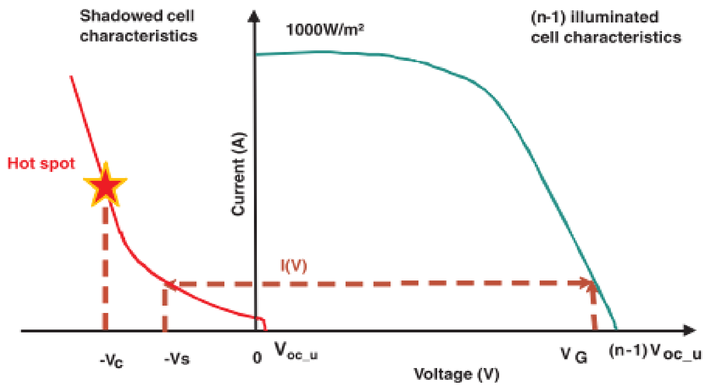
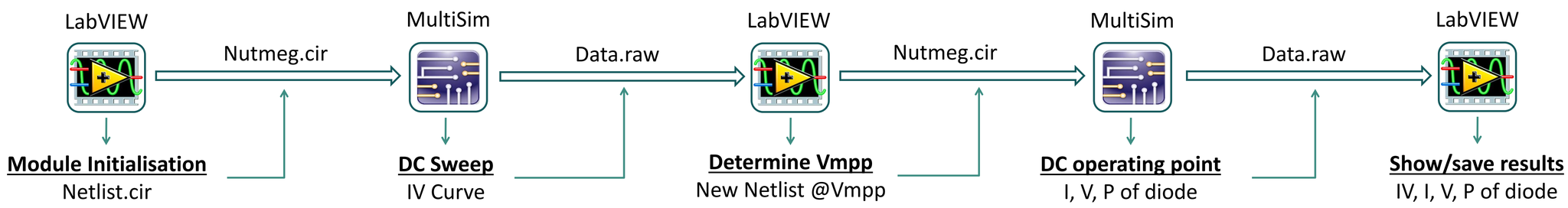
INTRODUCTION

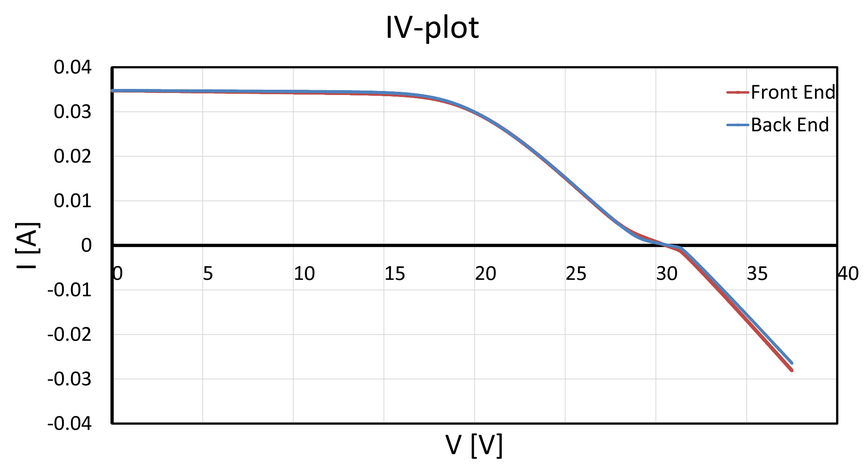
Recent studies show that thin film photovoltaics (TFPV) are prone to shading damage. When one cell in a TFPV module is shaded, the other cells connected in series will push the current in reverse through the shaded cell. This creates hot spots and eventually breakdown when the power of the other cells in series connected is sufficient. In this poster, we present a model which can be used to determine the impact of interconnection technology on shading damage by TFPV modules.

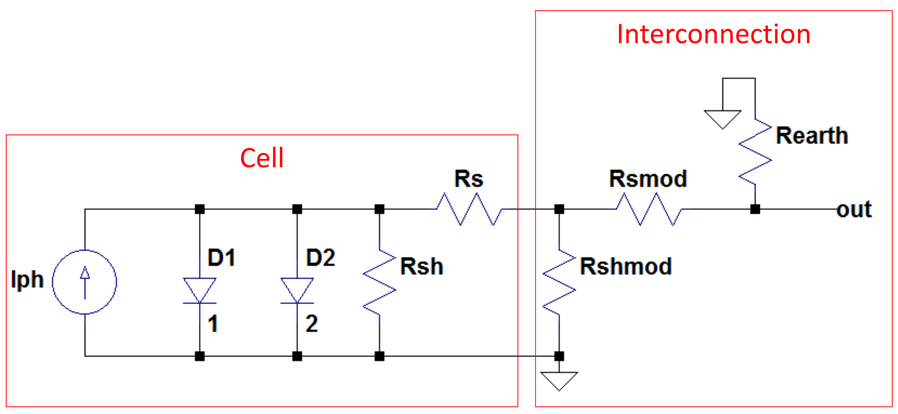


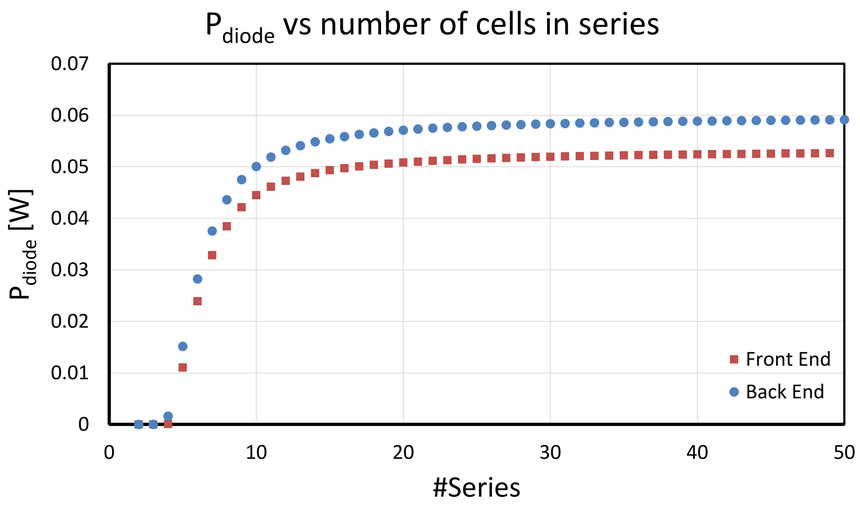
TEST METHOD

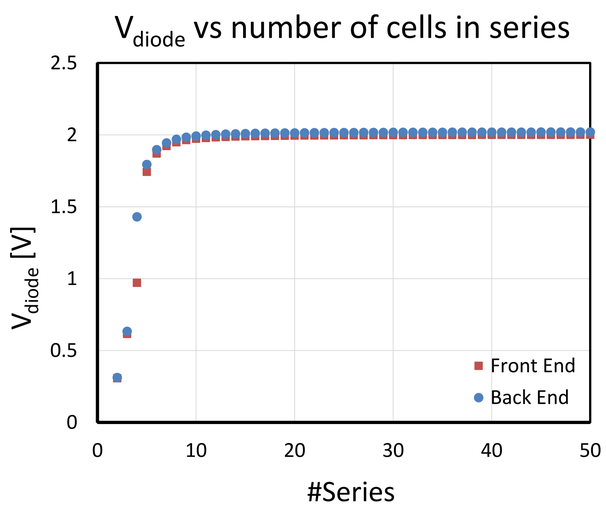


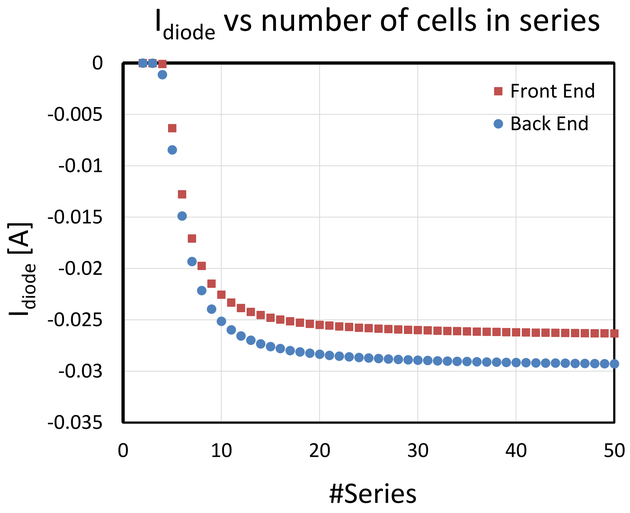
RESULTS











CONCLUSIONS

- A model to simulate the electrical properties of a CIGS TFPV module is proposed;
- It is observed that the interconnection technology might impact possible shading damage;
- Future work includes the verification and optimization of the model.

REFERENCES

- STMicroelectronics, "How to choose a bypass diode for a silicon panel junction box"
- Silverman et al., "Shadows from People and Tools Can Cause Permanent Damage in Monolithic Thin-Film Photovoltaic Modules"
- Sun et al., A Physics-Based Compact Model for CIGS and CdTe Solar Cells: From Voltage-Dependent Carrier Collection to Light-Enhanced Reverse Breakdown

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