

Design of optimized path for PV solar cells

General Outlook

The thesis will address theoretically and numerically the issues related with the optimization of the path of the conductors printed on a PV cells. Today solar cells make use of conductor path quite simple, where the printed wires are all parallel one to each other. The challenge is from one hand to increase the efficiency of electron transport, and from the other to decrease the area occupied by the printed wires. Current geometries work exclusively for homogeneous irradiation.

The thesis will address the issues related with the optimization of the printed wire design for different irradiation profiles, as observed in solar concentrators. The student will have to explore theoretically and numerically current design before moving to more complex geometries. Gaussian irradiation profile will be explored in details and a final design shall be presented, showing the benefits of the selected geometry. The purpose is to develop a numerical tool that will allow the design of more efficient solar cells.

The work will be performed in collaboration with the private company WS Energia Lda and it will be an important contribution to a larger R&D project financed by the QREN.

It is foreseen that the design procedures will be tested experimentally. The results shall be published in international journals of repute.