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M. Frazão, J.A. Silva, K. Lobato, J.M. Serra

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Electroluminescence of silicon solar cells using a consumer grade digital camera

M. Frazão[1], J. A. Silva[2*], K. Lobato[2], J. M. Serra[2]

[1] Faculdade de Ciências, Universidade de Lisboa, Portugal

2 Instituto Dom Luiz, Faculdade Ciências, Universidade Lisboa, Portugal

*corresponding author: jose.silva@fc.ul.pt

Abstract

Electroluminescent imaging is increasingly used to detect defects in silicon solar cells. However, the cost of the conventional luminescence systems is a limiting factor for generalized use. A simple and reliable low-cost electroluminescence setup is presented. The developed system was tested on commercial silicon solar cells for the acquisition of electroluminescence images in the forward and reverse bias regimes. In forward bias the temperature was varied whilst in reverse bias the applied voltage was varied. The results used in conjunction allowed for the detection of defective areas and identification of their type and cause.