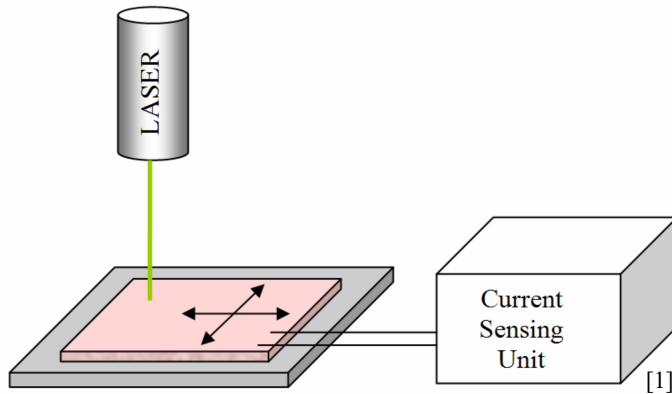


Bachelor- / Master Thesis

Laser Beam Induced Current Measurements



Objective

The rapid increase of the conversion efficiency of perovskite solar cells due to their enormous potential provides a very promising possibility to improve the efficiency of various solar modules significantly to potentially over 35%. For an efficient extraction of the charge carriers, interconnection lines of thin-film solar modules are necessary. However, they reduce the active area of the solar modules and thus lower their overall efficiency. Laser-scribing of interconnection lines of Perovskite thin-film solar modules has already been demonstrated to be a promising technique for high accuracy, low-cost interconnection fabrication. Nevertheless, it raises new challenges regarding ablation mechanism, debris redeposition and degradation due to heat. Therefore, a laser beam induced current (LBIC) measurement setup is envisaged to provide detailed information about the local current generation of laser-scribed perovskite solar modules. The scope of work includes the installation of necessary setup components, creation of a setup control program (LabVIEW) including a clear UI and validation of the setup's functionality by performing measurements on perovskite solar modules.

The facilities of the Institute of Microstructure Technology will provide a perfect environment for insights in interdisciplinary work between physics, mechanical and electrical engineering. The candidate will get the opportunity to work in a young and highly motivated international team and will get precious experience. This is a multidisciplinary project, so a will to broaden horizons and strengthen a diverse set of skills is also desirable.

Prerequisites

We are looking for a candidate with a strong affinity for development and experimental work. Also a fundamental understanding of refractive optics is indispensable. The ideal candidate should have a strong drive to engage with research activity which often implies addressing novel challenges. Prior experience with LabVIEW as well as lab experience will be advantageous.

[1] <https://www.tu-ilmenau.de/de/techphys1/team-solution-processed-photovoltaics/equipment/light-beam-induced-current/>

Research areas

Micro and Nanosystems,
Nano-photonics,
Solar Energy

Places

IMT (KIT, Campus North)

Focus

Development,
Characterization

Study path

Physics or
Electrical/Mechanical
engineering or
Optics & Photonics

Application period

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