NEWSLETTER: April 14th, 2015

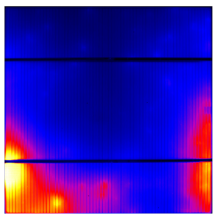
(1) greateyes launches LumiSolarProfessional BL 32Mpx High resolution EL system now available

greateyes introduces a highly sensitive tool for electroluminescence (EL) inspection of solar modules. Compared to the standard LumiSolarProfessional 8Mpx version the EL image size of the new version increased by a factor of four. The system closes the gap between the standard version and LumiSolarProfessional R&D. It's the best compromise with respect to resolution and throughput. Due to the extraordinary sensitivity which is characteristic for all greateyes systems it is capable to measure all materials such as crystalline and amorphous silicon, CIGS, CIS, CdTe, HIT, and multi-junction. As a bottom load (BL) system it offers high flexibility to measure a variety of differently shaped modules: it can be used to inspect non-laminated and finished PV modules of different sizes with sunny side up. Modules are inserted in a comfortable height of 90cm.

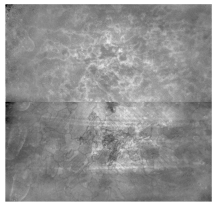
The BL 32Mpx version of LumiSolarProfessional system is designed for demanding applications in R&D and industrial process control for precise EL characterisation. The system employs two scientific high-performance CCD cameras in combination with a precision linear axis. Together they form a fast working EL imaging unit which offers both, market-leading sensitivity and high resolution through the scanning process.

(2) Advanced LumiSolarCell system features dark lock-in thermography and inspection of as-cut wafers

The award-winning LumiSolarCell LED-based PL and EL system for characterisation of solar cells and wafers is now available as an advanced version. Besides EL, reverse biased EL, PL, biased PL, measurement of the series resistance and IR measurements, it is now possible to add two more features to the LED-based system: I) dark lock-in thermography (DLIT) and II) inspection of as-cut wafers. For our existing customers we are offering system upgrades.



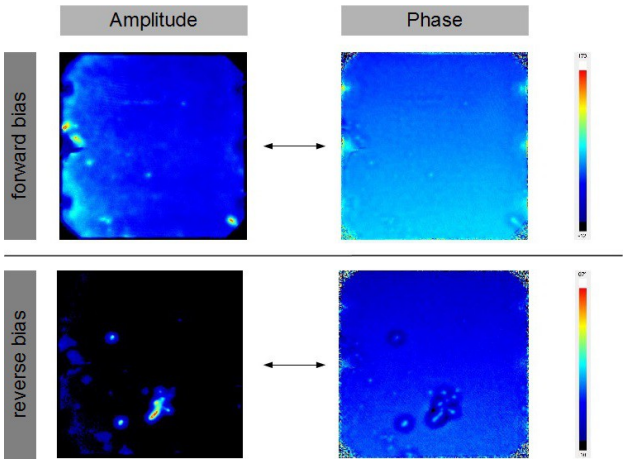
Lock-in thermography



PL of as-cut wafer

I) Compared with steady-state IR imaging, the spatial resolution is significantly increased by applying DLIT. With this method it is possible to detect faint shunts and resolve temperature differences of a few mK. It is furthermore possible to distinct between ohmic and non-ohmic shunts.

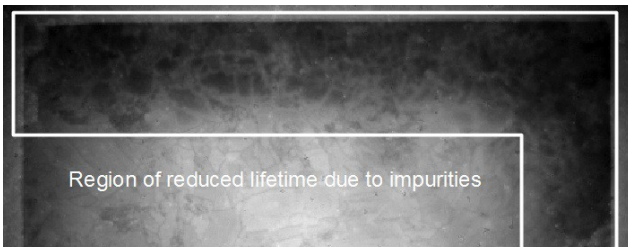
The principle of lock-in thermography is based on a periodical excitation of the solar cell and capturing an IR image in each period. Pixel by pixel the Fourier transform of the sequence of images is calculated. This results in two images: The phase shift between signal and lock-in excitation is shown in a phase image. A second image, called amplitude image, represents the phase-independent display of the local temperature.



Either forward or reverse bias can serve as excitation source. Typically reverse bias DLIT is used to display strong shunts but also to study the cell's breakdown behaviour. Forward bias DLIT normally gives a more detailed image where also faint shunts can be resolved. This appears even though cell failures under forward bias exhibit only small temperature differences (compare also upper and lower half of the image on the top left).

II) PL inspection of as-cut wafers is the second new feature of LumiSolarCell. It's the first time that this can be realised by a commercially available LED-based system. Due to the wafer's rough surface and hence the short lifetime of free charge carriers, the PL emission is decreased by multiple orders compared to processed wafers or finished solar cells.

The qualitative PL imaging of as-cut wafers reveals the quality of the raw wafer material. The image on the right shows a wafer from the edge of an ingot with typical impurity pattern. The lower intensity in this part is directly correlated to a reduced lifetime which will lead to a low efficiency solar cell after further processing.



Summary: The two new supplements described above turn the award-winning LumiSolarCell system into the most versatile tool on the market. Besides micro-cracks, printing defects, inhomogeneities, and others, the system now detects regions of low lifetime of as-cut wafers and small shunts as well. It is therefore a powerful tool for diverse production and research activities. The knowledge gained will be the foundation for next generation solar cells, increased product quality and higher yield.

Upcoming Exhibitions

Get in touch with greateyes and learn about the products during the following events:

Solarex Istanbul – Solar Energy and Technologies Fair
9 – 11 April 2015, İstanbul Fair Center

PVTC – PhotoVoltaic Technical Conference
27 – 29 May 2015 in the Aix-en-Provence Congress Center

EU PVSEC 2015
15 – 17 September 2015 at the Congress Center Hamburg

Presentations & Product Demonstration

In case you are interested to evaluate greateyes inspection systems together with your application, please send a request.

Contact details:

greateyes GmbH
Rudower Chaussee 29
12489 Berlin

phone: +49 30 6392 6237
fax: +49 30 6392 6238
email: info@greateyes.de

web: www.greateyes.de