

# Potential Induced Degradation of Solar Modules - Atom-Level Defect Diagnostics & Metrology at Large Devices

## tutorial

October 10, 2018 | 4:00 pm  
Lecture Hall MPI | B.1.11



### Abstract

Potential-induced degradation of the shunting type (PID-s) in silicon solar cells is a fatal failure mode of photovoltaic modules that is attributed to planar crystal defects at the cell front surface. These so-called stacking faults with a length of a few micrometers, penetrating the p-n junction, behave as shunts when they are decorated with Na atoms.

Atom-level defect diagnostics and root cause analysis in semiconductor devices with a size of more than 1 square meter will be addressed. The implementation of high-resolution microanalytic methods (LIT, EBIC/SEM, FIB, TOFSIMS, TEM), correlative diagnostic work flows and innovative stress test setups is demonstrated in this case study. The current challenges on next generation solar cell technology as well as solutions for PV system monitoring of PID degradation and recovery kinetics are discussed.

### Speaker

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