Scuola universitaria professionale della Svizzera italiana
Dipartimento ambiente costruzioni e design
Istituto sostenibilità applicata all'ambiente costruito

SUPSI

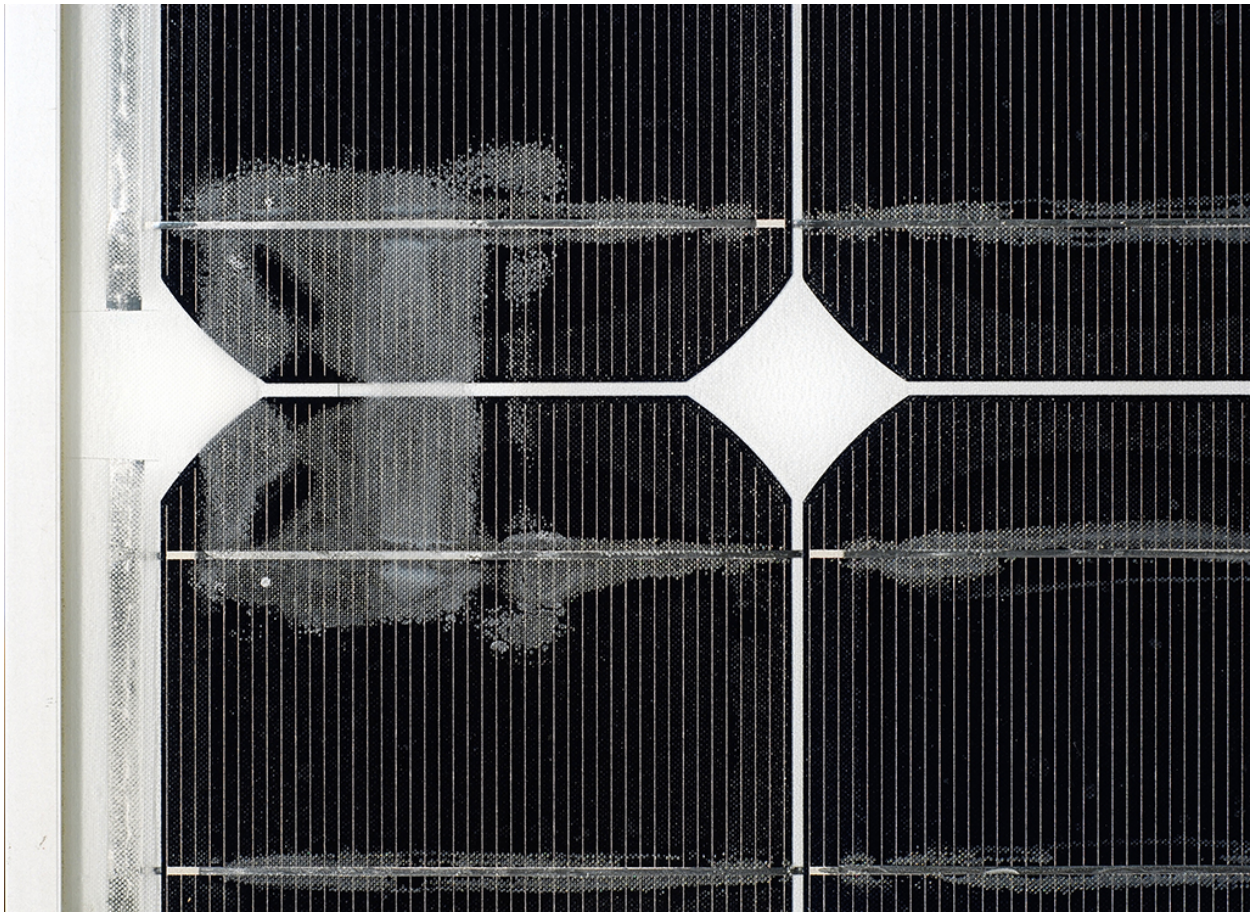
Feasibility study on innovative methodology for PV modules failure detection

Giovanni Bellenda, Technical Responsible SUPSI-PV Lab

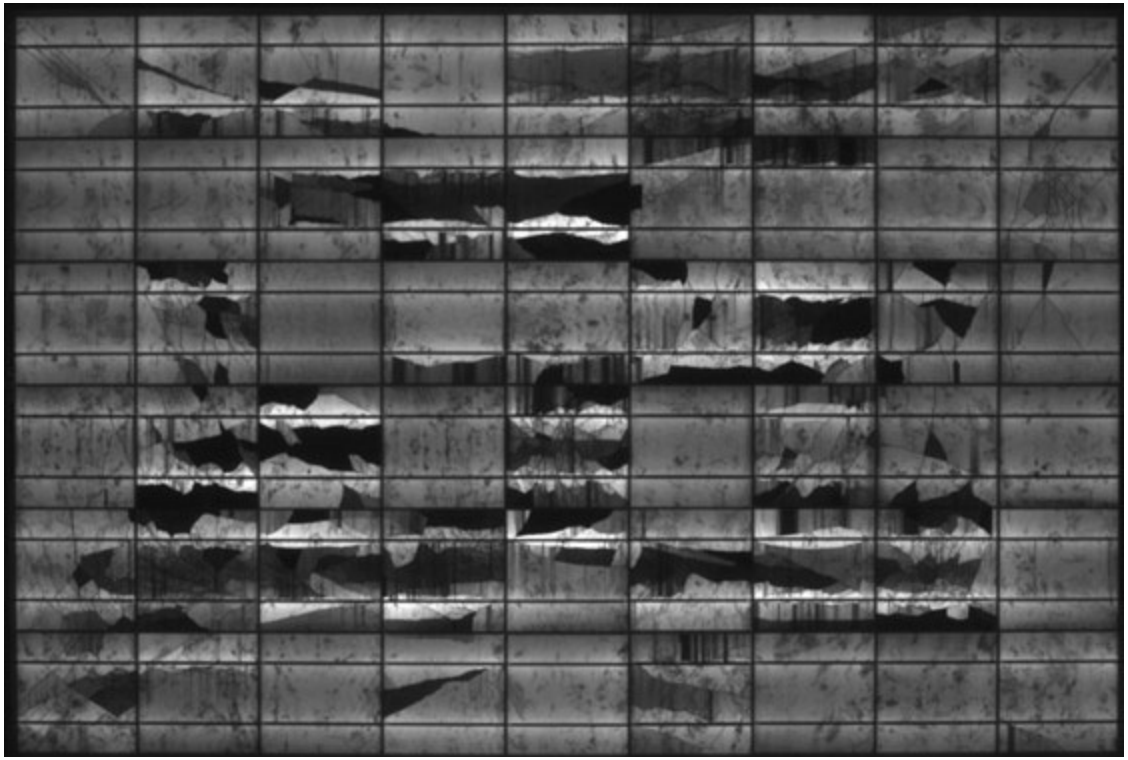
How to detect failures in PV modules
Consolidated techniques:

- Visual inspection
- IR Thermography
- Electroluminescence
- Strings and modules power measurements

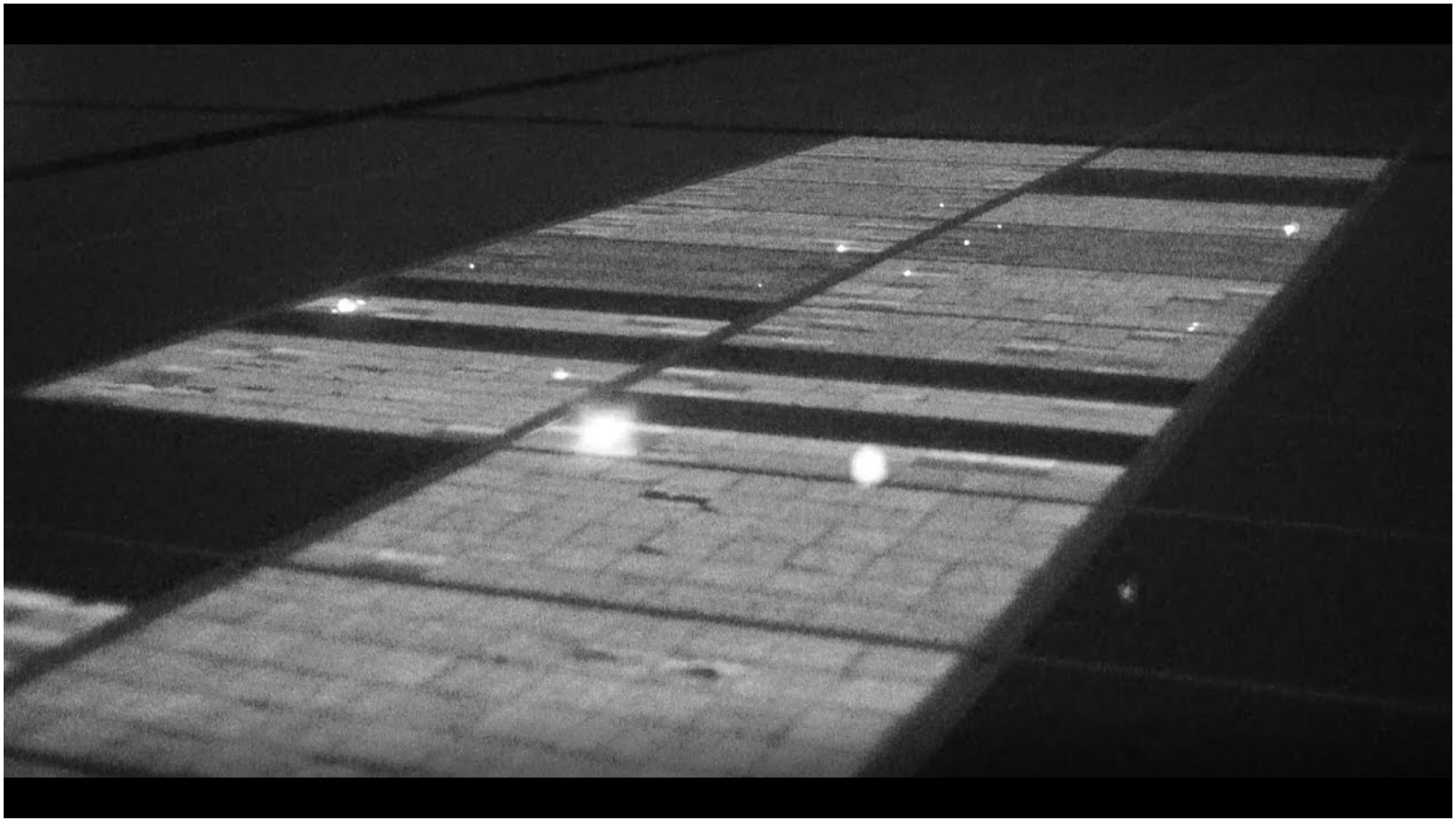
Visual inspection



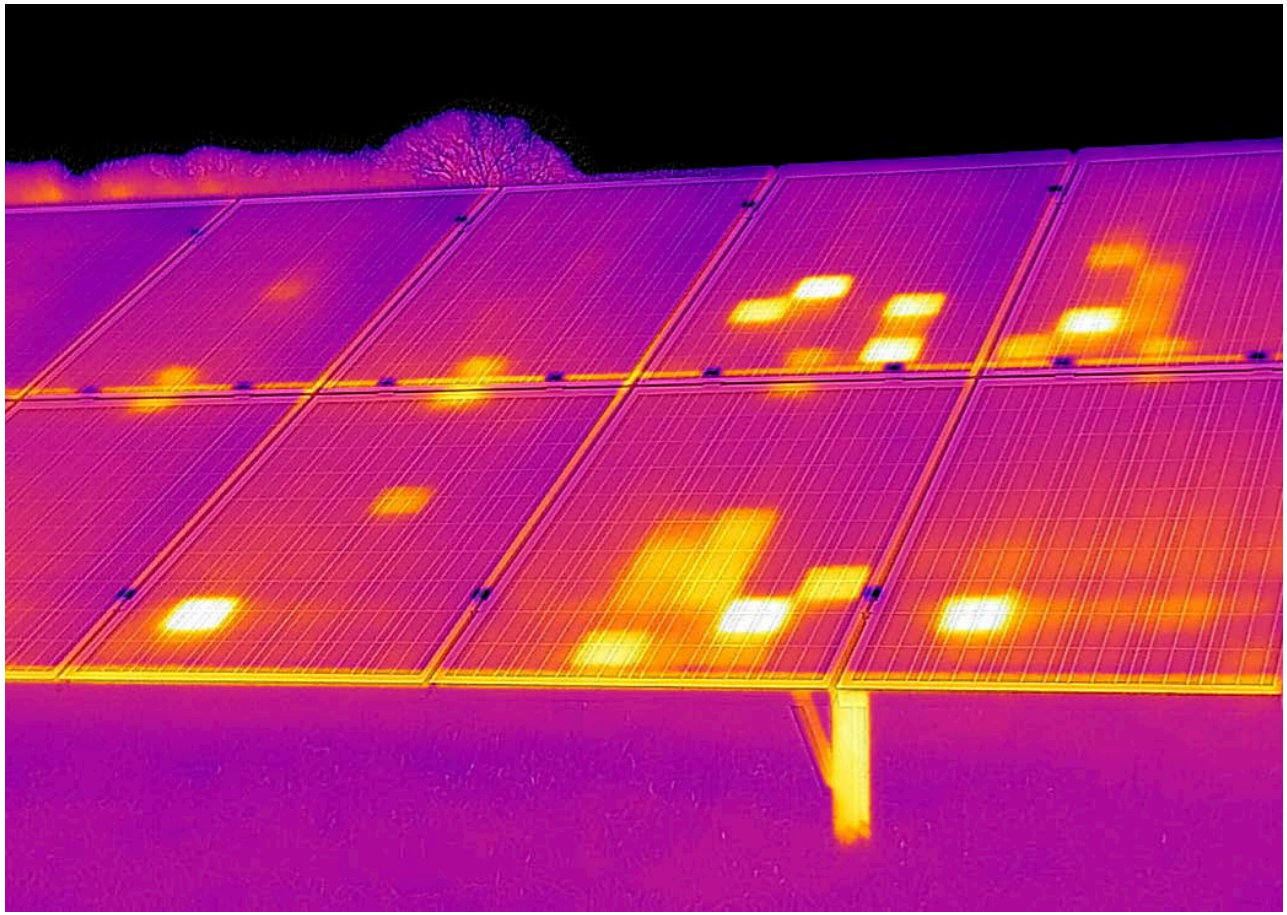
Electroluminescence



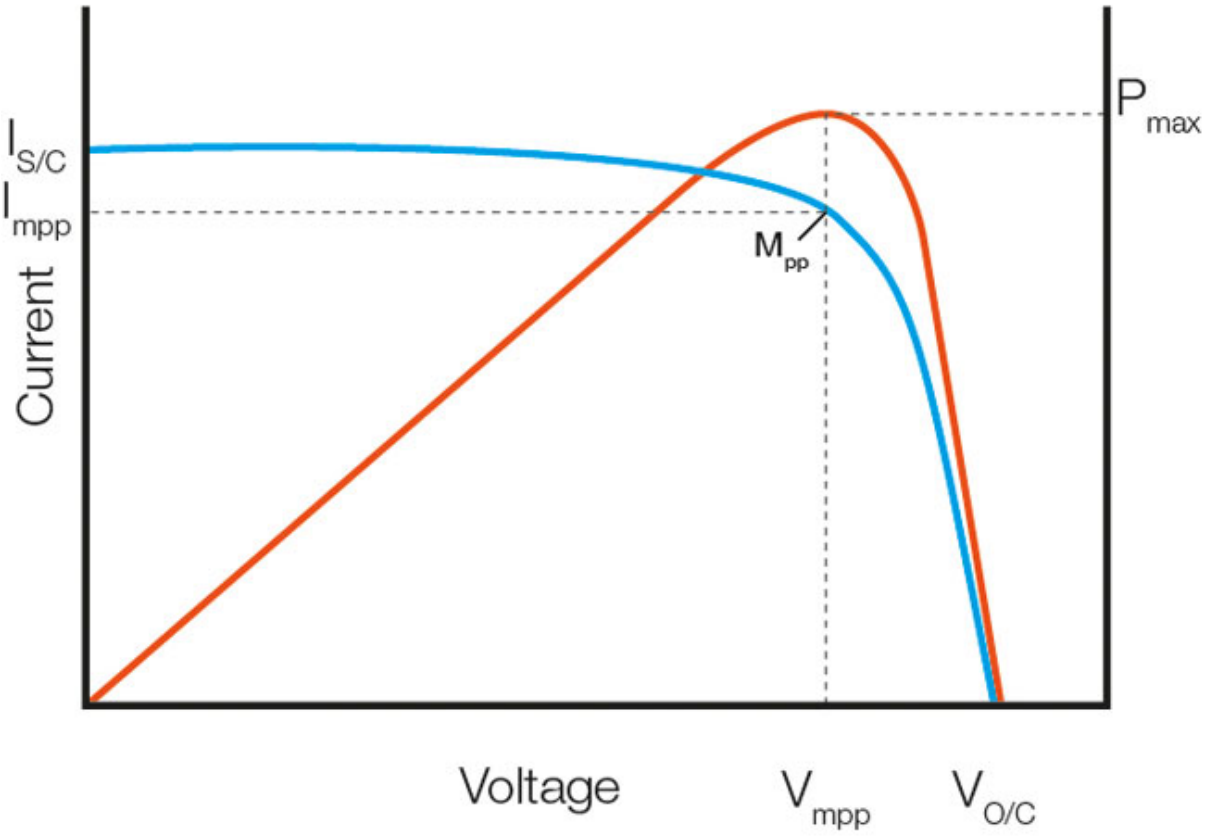
Electroluminescence «in situ»



IR Thermography



Performance measurements



Non-invasive diagnostic technique of the operating state of photovoltaic modules

- Feasibility study involving:
  - Telecom telemetry laboratory and high frequency (TTHF Lab) of SUPSI
  - ISAAC – SUPSI
  - EMPA
  - Zürcher Hochschule für Angewandte Wissenschaften (ZHAW)

Preliminary results

- Measurements of the impedance and I-V curves to collect first (preliminary) set of data comparing two PV modules (one without defects and one with some known failures, but with only slightly reduced power output):

Measurement results