SOPHIA
European Research Infrastructure

Announcement (5)

8th SOPHIA Workshop PV-Module Reliability

September 4th – 5th, 2018
University of Ljubljana, Slovenia

OBJECTIVES:

INNOVATIONS IN MATERIALS AND APPLICATIONS ARE CALLING FOR NEW PERFORMANCE AND DURABILITY ASSESSMENT

The University of Ljubljana (Slovenia) and the Fraunhofer Institute for Solar Energy Systems ISE (Germany) are proud to invite to the 2018 SOPHIA-workshop 'PV-Module Reliability' in Ljubljana, Slovenia. The 2018 workshop will feature reliability aspects in connection with new challenges imposed by novel components of PV modules, presently observed failure modes and the further development of suitable test cycles towards service life testing. The workshop will be embedded in a EUROREG workshop which is intended to provide a forum of global trends and current challenges in photovoltaics and nanophotonics in the fields of research, industry and market (http://euroreg-pv.fe.uni-lj.si). This year's topics of the workshop are:

- **Reliability aspects in PV-Power plants**
  On one hand the Potential Induced Degradation showed the dramatic impact of the string design and the inverter topology on the PV-module degradation. But on the other hand a non-uniform module degradation leads to an increased power-loss because of mismatch effects.
- **Recent reliability issues and field failures**
  Modules become more durable and more powerful with further R&D. Previously dominating durability problems are solved but new failure modes can occur by using new materials.
- **Location specific stress combinations**
  Most of the standardized type approval tests are performed for one single stress factor only. But nature is diverse. Degradation modes based on combined stress factors are neglected. On the other hand, to combine different stress factors correlating the natural abundance, like ultraviolet light, temperature, thermomechanical stress, based on temperature cycles, mechanical stress, humidity, pollutants and soiling, or to control the stress levels is a big challenge. The questions how to realize such combined tests or to simulate them by applying sequential stress tests or to carry out representative tests on a mini-module level are to be discussed.
- **Polymers in PV-modules**
  Polymers for encapsulation are very important for the production processes and the durability of PV-modules. Innovative materials offer chances for improved performance and reduced prices, but the durability has to be kept at a high level.
- **Flexible Modules**
  Substitution of glass and even Silicon cells enable new production methods, module-designs and applications. Can the present standards be applied for qualification testing?

Regular Registration fees : 400 EUR – Early Bird Discount until August 19th: 300 EUR -
Registration fees for students: 350 EUR – Early Bird Discount for students until August 19th: 250 EUR

For more information and for **registration** please visit the workshop's website:

www.pv-reliability.com

Structure

The program topics will be presented by experts and further developed in discussion groups.

Block 1: Reliability and degradation effects in PV-Power plants
a) Scientific and economic comparison of outdoor charcterization methods for photovoltaic power plants, Christina Hirschl, CTR
b) LCA and Labelling, Andreas Wade, FirstSolar

Block 2: Recent reliability issues and field failures
a) What happens most? Jürgen Arp, PV-Lab Potsdam
b) Monitoring methods and systems for PV reliability assessment, Marko Jankovec, University of Ljubljana

Information Block: SolarTrain (https://solar-train.eu)
a) Climatic degradation factors, Julian Ascencio, University of Lubljana
b) Analyzing degradation and failure modes of PV-Modules, Aziz Nairi, CENER
c) Polymeric materials in PV-modules, Chiara Barretta, PCCL
d) Service Lifetime Prediction for PV modules and Systems and Economic Impact, Ismail Kaaya, Fraunhofer ISE

Block 3: Characterization of location specific stress combinations
a) Benchmarking of degradation of commercial PERC PV modules, Ralph Gottschalg, Fraunhofer CSP
b) Influence of variable climatic stress conditions on performance and material degradation of PV-modules, Gabriele Eder, OFI

Discussion Block
a) New combined cycles for future test standards in IEC TC82 WG2, Tony Sample, JRC
b) Discussion (groups/plenary)

Block 4: Polymers in PV-modules
a) FTIR study of EVA chemical bonding and its impact on debond energy, Laura Spinella, NREL
b) Effect of EVA aging on PID, Kristijan Brecl, University of Ljubljana
c) Round robin weathering test of various back-sheets for PV-modules with different ultra-violet radiation sources and sample temperatures, Michael Köhl, Fraunhofer ISE
d) PV materials and modules developed for certain climatic zones, Gernot Oreski, PCCL

Block 5: Flexible Modules
a) Progress in Reliability and Reliability testing at Heliatek, Mackael Lapeyrade, Heliatek
b) Experiences in development and testing of flexible PV-modules, Robert Buchinger, Sunlumo
c) The art of standardizing the testing of polymers in PV-modules, Jürgen Jung, Agfa Gevaert

Plenary discussion with presentation of discussion group results

Optional: Technical Tour **:** Visit of Laboratory of Photovoltaics and Optoelectronics at University of Ljubljana

Fraunhofer ISE
Univerza v Ljubljani
University of Ljubljana
Faculty of Electrical Engineering

Organizer
Fraunhofer ISE, Dr.-Ing. Michael Köhl

Host
University of Ljubljana, Prof. Marko Topič

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