



2nd International Workshop on the  
Sustainable Actions for “Year by Year Aging” under Reliability  
Investigations in Photovoltaic Modules, 2017

# SAYURI-PV 2017

## Agenda

**Date:** November 11th – 12th, 2017

**Venue:** Ryukoku University, Seta Campus (Building 8)  
1-5 Yokotani, Seta Oe-cho, Otsu, Shiga 520-2194, JAPAN  
<http://www.ryukoku.ac.jp/english2/about/access/seta.html>

### Organizing Committee

**Chair:** Koji Matsubara  
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Tadanori Tanahashi      Kazufumi Tanaka      Miki Terada  
Yuzuru Ueda      Masaaki Yamamichi

### Host

Research Center for Photovoltaics (RCPV)  
in National Institute of Advanced Industrial Science and Technology (AIST)  
<https://unit.aist.go.jp/rcpv/cie/>

This workshop is held under the auspices of The Japan Electrical Manufacturers' Association (JEMA).

**2nd International Workshop on the Sustainable Actions for “Year by Year Aging” under Reliability Investigations in Photovoltaic Modules, 2017 (SAYURI-PV 2017)**

**[Day 1] November 11th**

- 9:30- Opening Remarks                      Yasuaki Ishikawa      (NAIST)
- 9:35- Welcome                                Koji Matsubara        (AIST)
- 9:40- Welcome                                Takahiro Wada        (Ryukoku Univ.)

**Session I: Keynote (Field Experience)      Chair: Yasuaki Ishikawa (NAIST)**

- 9:45- Annual degradation rates of recent crystalline silicon PV modules and a study of the energy rating standard for PV modules under subtropical coastal climatic conditions  
Tetsuyuki Ishii<sup>1</sup> and Atsushi Masuda<sup>2</sup>    (1CRIEPI, 2AIST)

**Session II: Cell (1)                                      Chairs: Keiichiro Sakurai (AIST) and Yasuo Chiba (AIST)**

- 10:30- What is the potential-induced degradation? -Systematic study on various kinds of photovoltaic cells-  
Atsushi Masuda<sup>1</sup> and Keisuke Ohdaira<sup>2</sup>    (1AIST, 2JAIST)
- 11:00- Internal quantum efficiency mapping for evaluation of rear side of solar cells  
Toshimitsu Mochizuki    (AIST)
- 11:30- Dry heat testing under light irradiation of CIGS solar cells  
Jiro Nishinaga and Hajime Shibata    (AIST)

11:50- Lunch [Self Pay]

**Cell (2)    Chair: Hajime Shibata (AIST) and Tadanori Tanahashi (AIST)**

- 13:00- Integrated measurement of electroluminescence and current-voltage characteristics of photovoltaic modules  
Takashi Fuyuki<sup>1</sup>, Hiroshi Taniguchi<sup>2</sup>, Yoshiteru Nitta<sup>2</sup>, Kohji Masuda<sup>2</sup>, Yasunori Uchida<sup>2</sup>, and Tadashi Obayashi<sup>2</sup>  
(1Active Solar Innovation, 2JET)

**Session III: Metallization                              Chairs: Tadashi Obayashi (JET) and Tadanori Tanahashi (AIST)**

- 13:30- Reliability of PERC solar modules from cell metallization prospective  
Marwan Dhamrin, Shota Suzuki, Morishita Naoya, Masahiro Nakahara, and Yoshiki Hasizume  
(Toyo Aluminium)
- 14:00- Degradation behavior of electrical contacts with acetic acid in c-Si PV cells  
Tadanori Tanahashi, Yukiko Hara, Norihiko Sakamoto, Hajime Shibata, and Atsushi Masuda  
(AIST)
- 14:30- Corrosion mechanism on the interfacial glass layer between the metallization and the Si wafer of silicon solar cells by high-temperature high-humidity test  
Taeko Semba<sup>1</sup>  
Takeo Shimada<sup>1</sup>, Kazuyoshi Yamada<sup>1</sup>, Katsuhiko Shirasawa<sup>2</sup>, and Hidetaka Takato<sup>2</sup>    (1Namics, 2AIST)

15:00- Break (30 min)

**Session IV: Polymer (1)                                      Chairs: Nick Bosco (NREL) and Atsushi Masuda (AIST)**

- 15:30- The long-term life expectancy of 30 years of silicon PV module analyzed by laser technique  
Yasuaki Ishikawa<sup>1</sup>, Hiroataka Iida<sup>2</sup>, and Hidenari Nakahama<sup>2</sup>    (1NAIST, 2Nisshinbo Mechatronics)
- 16:00- The role of material interactions in PV module reliability  
Gernot Oreski    (PCCL)
- 16:45- Structural analysis of the degraded EVA encapsulant in crystalline silicon photovoltaic module using positron annihilation lifetime spectroscopy  
Hideaki Hagihara, Hiroaki Sato, Yukiko Hara, Sachiko Jonai, and Atsushi Masuda    (AIST)

17:15 End of 1st Day

18:00- Network Meeting

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**[Day 2] November 12th**

**Session V: Polymer (2)                                      Chairs: Gernot Oreski (PCCL), Takashi Ishihara (Mitsubishi Electric), and Tadanori Tanahashi (AIST)**

- 9:00- Study on reliability and long-term durability of bifacial module in terms of comparison of transparent backsheet type with glass type  
Keita Arihara<sup>1</sup>, Ryosuke Koyoshi<sup>1</sup>, Yasuhiro Ishii<sup>1</sup>, Masaru Kadowaki<sup>1</sup>, Atsushi Nakahara<sup>1</sup>, Hitoshi Nishikawa<sup>1</sup>, Kinichi Ogawa<sup>2</sup>, Yasuo Chiba<sup>2</sup>, and Atsushi Masuda<sup>2</sup>  
(1Dai Nippon Printing, 2AIST)
- 9:20- Impact of backsheet quality on PERC module reliability  
Yoshiki Hasizume, Marwan Dhamrin, Sakamoto Hiroyuki, and Maeda Daisuke  
(Toyo Aluminium)
- 9:50- (PV module field failure in Thailand)  
Manit Seapan    (KMUTT)
- 10:20- Short-term and long-term field failures related to PV encapsulant in Japan  
Tsuyoshi Shioda    (Mitsui Chemicals)
- 10:50- Quantifying adhesion in PV modules: A historical survey and degradation processes  
Nick Bosco    (NREL)

11:20- Break (30 min)

**Session VI: General Discussion                              Chair: Masaaki Yamamichi (RTS Corp.)**

- 11:50- JP efforts for PV-reliability standardization  
Isao Yoshida    (JEMA)
- 12:05- **GENERAL DISCUSSION:**  
**Theme: Feasibility of “service lifetime prediction” (based on “durability / aging of materials”)**  
Moderators: Yasuaki Ishikawa, Tadanori Tanahashi, and Tsuyoshi Shioda

12:50- Closing Remarks                                      Yasuaki Ishikawa    (NAIST)

13:00 Adjourn

18:00- PVSEC-27: Welcome Reception *at Lake Biwa Otsu Prince Hotel*

