Opening

Monday, November 13

Opening Ceremony

13:30-15:35

Master of Ceremony:
Yuzuru Ueda (Tokyo University of Science)

13:30-13:35

Opening Address

T. Wada (Ryukoku University)

13:35-13:40

Welcome Address

T. Mikazuki (Governor of Shiga Prefecture)

[Opening lecture]

13:40-14:10 OL1

RENEWABLE ENERGY POLICY IN JAPAN

T. Yamazaki (Agency for Natural Resources and Energy)

14:10-14:25 OL2

SHIGA ENERGY VISION ～FOR THE REALIZATION OF A NEW ENERGY SOCIETY～

Y. Nakajima (Energy Policy Division, Shiga Prefecture)

14:25-14:40 OL3

THE FIRST PRACTICAL REVERSE FLOW PV SYSTEM IN A JAPANESE HOUSE HAS BEEN RUNNING STEADILY FOR 25 YEARS

Y. Kuwano (PVTEC)

[Award Presentation]

14:40-14:45

PVSEC Award

Introduction:

M. Yamaguchi (Toyota Technological Institute)

Presenter:

T. Wada (Ryukoku University)

14:45-15:05

Memorial Lecture

Y. Hishikawa (AIST)

15:05-15:15

PVSEC Special Award

Introduction:

M. Yamaguchi (Toyota Technological Institute)

Presenter:

T. Wada (Ryukoku University)

15:15-15:20

Hamakawa Award

Introduction:

M. Yamaguchi (Toyota Technological Institute)

Presenter:

M. Konagai (Tokyo City University)

15:20-15:35

Memorial Lecture

T. Miyasaka (Toin University of Yokohama)

Keynote, Plenary, Special Talks

16:00-19:00

[Keynote & Plenary talks]

Chair persons:
T. Wada (Ryukoku University)
I. Kaizuka (RTS Corporation)

16:00-16:30 KN.1

[Keynote]

HIGH EFFICIENCY HETEROJUNCTION CRYSTALLINE SI SOLAR CELLS

K. Yamamoto (Kaneka Corporation)

16:30-17:00 KN.2

[Keynote]

From powering satellites to powering humanity : what role for international R&D on Photovoltaics?

D. Lincot (CNRS and IPVF)

17:00-17:30 10MoPl.1

[Plenary]

The arising Role of PV and Wind Energy in the Power Sector and beyond

C. Breyer (Lappeenranta University of Technology)

[Special talks]

Chair person:
A. Yamada (Tokyo Institute of Technology)

17:45-18:15 4MoOS.1

[Invited]

DESIGN OF POLYMERS WITH STRONG TEMPERATURE-DEPENDENT AGGREGATION FOR HIGH PERFORMANCE ORGANIC PHOTOVOLTAICS

H. H. Yan (Hong Kong University of Science and Technology)

18:15-18:30 1MoOS.2

<Late News>

Multicrystalline silicon solar cells exceeding 22%

S. W. Glunz (Fraunhofer Institute for Solar Energy Systems)

18:30-18:45 1MoOS.3

<Late News>

Four-Terminal Perovskite-silicon Multijunction Solar modules

P. Pieters (imec)

18:45-19:00 10MoOS.4

<Late News>

Developing Utility Scale PV in the New FIT Act Era in Japan

J. Buford (First Solar Japan)

Withdrawn

Monday, November 13
8:30 - 10:00 Room 1+2+3 Area1
1MoO1 Cell Technology(1)

Chairpersons:
Thorsten Dullweber *(ISFH)*
Yoshio Ohshita *(Toyota Technological Institute)*

8:30 - 8:45 1MoO1.1

[Area Leading invited]

DEVELOPMENT OF MASS-PRODUCTION TECHNOLOGY FOR BACK-CONTACT TYPE SOLAR CELLS AND MODULES

Naoki Koide [1)], Chikao Okamoto[1)], Shuichiro Sugiyama[1)], Yoshihisa Dotta[1)], Hajime Horinaka[1)]

[1)] Energy Solutions BU, Sharp Corporation

8:45 - 9:00 1MoO1.2

INDUSTRY RELATED APPROACHES FOR BI-FACIAL P-TYPE PERX SOLAR CELLS

Tobias Fellmeth [1)], Sebastian Meier[1)], Elmar Lohmüller[1)], Nico Wöhrle[1)], Alma Spribille[1)], Sabrina Werner[1)], Holger Knauss[2)], Helge Haverkamp[2)], Nakahara Masahiro[3)], Marwan Dhamrin[3)], Pierre Saint-Cast[1)], Andreas Wolf[1)], Florian Clement[1)], Stefan Rein[1)], Ralf Preu[1)]

[1)] Fraunhofer ISE, Germany, [2)] Schmid Group, Germany, [3)] Toyo Aluminium K. K., Japan

9:00 - 9:15 1MoO1.3

22.8% LOW COST BIFACIAL n-PERT CELL WITH Ni/Ag CO-PLATED CONTACTS AND MORE THAN 95% BIFACIALITY

Philip Pieters [1)], Richard Russell[1)], Loic Tous[1)], Emanuele Cornagliotti[1)], Filip Duerinckx[1)], Dirk Hendrickx[1)], Jozef Szlufcik[1)], Jef Poortmans[1)]

[1)] imec, Belgium

9:15 - 9:30 1MoO1.4

FORMATION OF BLACK SILICON USING THE SIGE SELF-ASSEMBLED ISLANDS AS A MASK FOR SELECTIVE ETCHING

Yushi Ota [2)], Atsushi Hombe[2)], Yasuyoshi Kurokawa[2)], Noritaka Usami[2)], Alexey Novikov[1)], Mikhail Shaleev[1)], Dmitry Yurasov[1)], Natalie Baidakova[1)], Elena Morozova[1)], Eugene Skorokhodov[1)], Valery Verbus[2)]

[1)] Institute for Physics of Microsrtuctures RAS, [2)] Nagoya University

9:30 - 9:45 1MoO1.5

HIGH-EFFICIENCY C-SI SOLAR CELLS WITH DIFFERENT THERMAL BUDGETS

Miro Zeman [1)], Guangtao Yang[1)], Gianluca Limodio[1)], Paul Procel[1)], Hao Ge[1)], Yue Zhang[1)], Jiali Zhou[1)], Arthur Weeber[1)], Olindo Isabella[1)]

[1)] Delft University of Technology, Photovoltaic Materials and Devices group

9:45 - 10:00 1MoO1.6

INTERDIGITATED BACK-CONTACT SILICON HETEROJUNCTION SOLAR CELL FOR LIQUID PHASE CRYSTALLIZED SILICON ON GLASS WITH 14.2% EFFICIENCY

Cham Thi Trinh [1)], Natalie Preissler[1,2)], Paul Sonntag[1)], Martin Muske[1)], Martina Trahms[1)], Bernd Rech[1)], Daniel Amkreutz[1)]

[1)] Institute of Silicon Photovoltaics, Helmholtz-Zentrum Berlin für Materialien und Energie GmbH, [2)] PVcomB / Helmholtz-Zentrum Berlin für Materialien und Energie GmbH

Monday,November 13
8:30 - 10:00 Room 5 Area5
5MoO3 High Performance Cells

Chairpersons:
Masato Maitani *(The University of Tokyo)*
Shengzhong Frank Liu *(Dalian Institute of Chemical Physics, Chinese Academy of Sciences)*

8:30 - 8:45 5MoO3.1

HIGH PERFORMANCE PEROVSKITE MODULES FOR BUILDING INTEGRATED PHOTOVOLTAICS

Lucija Rakocevic [1)], Robert Gehlhaar[1)], Tamara Merckx[1)], Weiming Qiu[1)], Tom Aernouts[1)], Henri Fledderus[4)], Jef Poortmans[1,2,3)]

[1)] Thin film PV, Imec, Belgium, [2)] ESAT, KUL, Belgium, [3)] University of Hasselt, Belgium, [4)] TNO-partner in Solliance, Netherlands

8:45 - 9:00 5MoO3.2

203mm×203mm largest sized highly efficient $MAPbI_3$ solar module

Hiroshi Higuchi [1)], Takayuki Negami[1)]

[1)] Advanced Research Division, Panasonic corporation

9:00 - 9:15 5MoO3.3

Monolithic perovskite/silicon-heterojunction tandem solar cells

Xin Yao[1,2,3,4)], Lin Fan[1,2,3,4)], Shijie Zhu[1,2,3,4)], Qianshang Ren[1,2,3,4)], Cuicui Zheng[1,2,3,4)], Yi Ding[1,2,3)], Yuelong Li[1,2)], Guofu Hou[1,2)], Ying Zhao[1,2,3,4)], Xiaodan Zhang [1,2,3,4)], Shengzhe Li[1,2,3,4)], Yupeng Tong[1,2,3,4)], Biao Shi[1,2,3,4)], Huizhi Ren[1,2,3)], Qian Huang[1,2,3)], Changchun Wei[1,2)], Baozhang Li[1,2)], Guofu Hou[1,2)], Shengzhi Xu[1,2)], Dekun Zhang[1,2)], Guangcai Wang[1,2)]

[1)] Institute of Photoelectronic Thin Film Devices and Technology of Nankai University, [2)] Key Laboratory of Photoelectronic Thin Film Devices and Technology of Tianjin, [3)] Key Laboratory of Optical Information Science and Technology of Ministry of Education, [4)] Collaborative Innovation Center of Chemical Science and

Engineering (Tianjin)

9:15 - 9:30 5MoO3.4

OPTIMUM PEROVSKITE CELL FOR HIGHLY EFFICIENT PEROVSKITE/SILICON TANDEM SOLAR CELL

Wayesh Qarony [1)], Mohammad I. Hossain[1)], Yuen Hong Tsang[1)]

[1)] Department of Applied Physics, The Hong Kong Polytechnic University

9:30 - 9:45 5MoO3.5

OPTICAL DEVICE DESIGN OF HIGHLY EFFICIENT $CH_3NH_3Pb(I,Br)_3$/Cu(In,Ga)Se_2-BASED DOUBLE AND TRIPLE TANDEM SOLAR CELLS

Hiroyuki Fujiwara [1)], Masato Tamakoshi[1)], Shohei Fujimoto[1)], Takemasa Fujiseki[1)]

[1)] Department of Electrical, Electronic and Computer Engineering, Gifu University

9:45 - 10:00 5MoO3.6

PEROVSKITE / TEXTURED SILICON HETEROJUNCTION FOR MECHANICALLY STACKED TANDEM SOLAR CELL

Hiroyuki Kanda [1)], Naoyuki Shibayama[1)], Koji Ibi[2)], Mohammad Khaja Nazeeruddin[3)], Seigo Ito[1)]

[1)] University of Hyogo, [2)] Choshu Industry Co., Ltd., [3)] École Polytechnique Fédérale de Lausanne

Monday, November 13
8:30 - 10:00 Room 6 Area7

7MoO5 PV Performance Characterization (1)

Chairpersons:
Koji Masuda *(Japan Electrical Safety & Enviroment Technology Laboratories)*
Juan Lopez-Garcia *(European Commission, Joint Research Centre (JRC))*

8:30 - 9:00 7MoO5.1

[Invited]

LASER-DSR: COMPREHENSIVE REFERENCE CELL CALIBRATION IN LABORATORY AND ITS IMPACT ON OUTDOOR MEASUREMENTS

Stefan Winter [1)]

[1)] Physikalisch-Technische Bundesanstalt (PTB), Germany

9:00 - 9:15 7MoO5.2

INHERENT UNCERTAINTY OF ENERGY RATINGS OF MULTI-JUNCTION CELLS BY FLUCTUATION OF ATOMOSPHERIC PARAMETERS

Kenji Araki[1)], Yasuyuki Ota[2)], Takumi Sakai[2)], Kan-Hua Lee[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute, [2)] University of Miyazaki

9:15 - 9:30 7MoO5.3

TEMPERATURE DEPENDENCE OF THE SHORT CIRCUIT CURRENT AND SPECTRAL RESPONSE OF VARIOUS KINDS OF CRYSTALLINE SILICON PV DEVICES

Yoshihiro HISHIKAWA[1)], Masahiro YOSHITA [1)], Hironori OHSHIMA[1)], Kengo YAMAGOE[1)], Haruya SHIMURA[1)], Ayumi SASAKI[1)], Takashi UEDA[1)]

[1)] National Institute of Advanced Industrial Science and Technology (AIST)

9:30 - 9:45 7MoO5.4

OPTIMISED FITTING OF INDOOR (E.G. IEC 61853 MATRIX) AND OUTDOOR PV MEASUREMENTS FOR DIAGNOSTICS AND ENERGY YIELD PREDICTIONS

Steve J. Ransome [1)], Juergen Sutterlueti[2)]

[1)] Steve Ransome Consulting Limited, [2)] Gantner Instruments Environment Solutions GmbH

9:45 - 10:00 7MoO5.5

PV MODULE IRRADIANCE SENSOR FOR PRECISE OUTDOOR MEASUREMENT - STRUCTURE, RESPONSE SIMILARITY AND ANGULAR DEPENDENCE COMPARISON WITH THE MODULE UNDER TEST -

Takuya DOI [1)], Yoshihiro HISHIKAWA[1)], Michiya HIGA[1)], Takakazu TAKENOUCHI[1)], Hironori OHSHIMA[1)], Kengo YAMAGOE[1)]

[1)] RCPV, National Institute of Advanced Industrial Science and Technology (AIST)

Monday, November 13
10:30 - 12:00 Room 1+2+3 Area1

1MoO2 Cell Technology(2)(Device)

Chairpersons:
Miroslav Zeman *(Delft University of Technology)*
Kyotaro Nakamura *(Meiji University)*

10:30 - 11:00 1MoO2.1

[Invited]

Present status and future perspectives of bifacial PERC+ solar cells and modules

Thorsten Dullweber [1)]

[1)] Photovoltaics Department, Institute for Solar Energy Research Hamelin (ISFH)

11:00 - 11:15 1MoO2.2

22.0% EFFICIENCY BIPERC WITH 17.5% BACK BASED ON INDUSTRIAL PROCESS

Meng Xiajie [1)], Yu Bin[1)], Cai Yongmei[1)], Xu Xinxing[1)], Fan Jianbin[1)], Tong Hongbo[1)], Li Hua[1)]

[1)] Solar Cell Research Center, LONGi Solar Technology Co., LTD

11:15 - 11:30 1MoO2.3

INVESTIGATION OF THE ALUMINUM PASTE COMPOSITION AND LASER CONTACT OPENING GEOMETRY FOR PERC SOLAR CELLS

Masahiro Nakahara [1,2)], Marwan Dhamrin[1)], Jayaprasad Arumughan[2)], Stefan Schmitt[2)], Valentin Mihailetchi[2)], Jens Theobald[2)]

[1)] Toyo Aluminum, [2)] ISC Konstanz

11:30 - 11:45 1MoO2.4

DEVELOPMENT OF PASSIVATION FILMS FOR N-TYPE CRYSTALLINE SILICON SOLAR CELLS

Kunihiko Nishimura [1)], Yasutoshi Yashiki[1)], Takayuki Morioka[1)], Yumiko Kobayashi[1)], Tatsuro Watahiki[1)], Hidetada Tokioka[1)], Mikio Yamamuka[1)]

[1)] Advanced Technology R&D Center, Mitsubishi Electric Corporation

11:45 - 12:00 1MoO2.5

DEVELOPMENT OF HIGH EFFICIENT AND LONG-TERM RELIABLE CRYSTALLINE SILICON SOLAR CELLS AND MODULES BY LOW COST MASS PRODUCTION PROCESS

Yuta Irie [1)], Junichi Atobe[1)], Hiroaki Takahashi[1)], Kouichirou Niira[1)], Manabu Komoda[1)], Kenji Fukui[1)]

[1)] Solar Energy Development Division, Kyocera Corporation

Monday, November 13
10:30 - 12:00 Room 5 Area5

5MoO4 High Performance (Efficiency)

Chairpersons:
Atsushi Wakamiya *(Kyoto University)*
Sergei Manzhos *(National University of Singapore)*

10:30 - 11:00 5MoO4.1

[Invited]

HYSTERESIS-FREE PEROVSKITE SOLAR CELLS MADE OF POTASSIUM-DOPED ORGANOMETAL HALIDE PEROVSKITE

Hiroshi Segawa [1)]

[1)] Graduate School of Arts and Sciences, The University of Tokyo

11:00 - 11:15 5MoO4.2

LOW-TEMPERATURE PREPARED NIOBIUM-DOPED AMORPHOUS TITANUM OXIDE COMPACT LAYER IN HIGHLY EFFICIENT AND DURABLE PEROVSKITE SOLAR CELLS

Youhei Numata [1)], Yoshitaka Sanehira[1)], Atsushi Kogo[1)], Ryo Ishikawa[2)], Hajime Shirai[2)], Tsutomu Miyasaka[1)]

[1)] Toin University of Yokohama, [2)] Saitama University

11:15 - 11:30 5MoO4.3

HIGH EFFICIENT AND STABLE MAPBI3 BASED PEROVSKITE SOLAR CELLS

Liyuan Han [1)]

[1)] National Institute for Materials Science

11:30 - 11:45 5MoO4.4

18.3% RECORD-EFFICIENCY FLEXIBLE PEROVSKITE SOLAR CELLS

Shengzhong Frank Liu [1,2)], Dong Yang[2)]

[1)] Shaanxi Normal University, China, [2)] Dalian Institute of Chemical Physics, China

11:45 - 12:00 5MoO4.5

TOWARDS ACCURATE SPECTRAL RESPONSE MEASUREMENTS OF PEROVSKITE SOLAR CELLS

Martin Bliss [1)], Alex Smith[1)], Thomas Richard Betts[1)], Ralph Gottschalg[1)]

[1)] Centre for Renewable Energy Systems Technology (CREST), Loughborough University

Monday, November 13
10:30 - 12:00 Room 6 Area7

7MoO6 PV Performance Characterization (II)

Chairpersons:
Masahiro Yoshita *(National Institute of Advanced Industrial Science and Technology)*
Stefan Winter *(Physikalisch-Technische Bundesanstalt (PTB))*

10:30 - 10:45 7MoO6.1

FACTORS FOR IMPROVING THE PRECISION OF OUTDOOR PHOTOVOLTAIC PERFORMANCE MEASUREMENT

Yoshihiro HISHIKAWA [1)], Takuya DOI[1)], Michiya HIGA[1)], Takakazu TAKENOUCHI[1)], Hironori OHSHIMA[1)], Kengo YAMAGOE[1)]

[1)] National Institute of Advanced Industrial Science and Technology (AIST)

10:45 - 11:00 7MoO6.2

ACCURATE MEASURMENT AND ESTIMATION OF SOLAR CELL TEMPERATURE IN PHOTOVOLTAIC MODULE OPERATING IN REAL ENVIRONMENTAL CONDITIONS

Kensuke Nishioka [1)], Kazuyuki Miyamura[1)], Yasuyuki Ota[1)], Minoru Akitomi[2)], Yasuo Chiba[2)], Atsushi Masuda[2)]

[1] Research Center for Sustainable Energy & Environmental Engineering, University of Miyazaki, [2] National Institute of Advanced Industrial Science and Technology

11:00 - 11:15 7MoO6.3

LONGTERM PERFORMANCE AND DEGRADATION RATE ANALYSIS OF PV MODULE EXPOSED IN FIELD OF THE GOBI DESERT, MONGOLIA

Bat-Erdene Bayandelger [1], Yuzuru Ueda[1], Battulga Batbayar[2], Amarbayar Adiyabat[2], Kenji Otani[3]

[1] Department of Electrical Engineering, Tokyo University of Science, [2] National University of Mongolia, [3] National Institute of Advanced Industrial Science and Technology

11:15 - 11:30 7MoO6.4

FILTERING METHOD OF DETECTING SOLAR IRRADIANCE CONDITIONS FOR PV MODULE PERFORMANCE CHARACTERIZATION UNDER UNSTABLE IRRADIANCE

Zhang Junfang [1], Kota Watanabe[1], Jun Yoshino[1], Tomonao Kobayashi[1], Yoshihiro Hishikawa[2], Takuya Doi[2]

[1] Gifu University, [2] National Institute of Advanced Industrial Science and Technology

11:30 - 11:45 7MoO6.5

ELECTRICAL PERFORMANCE OF BIFACIAL SILICON PV MODULES UNDER DIFFERENT INDOOR SETTINGS AFFECTING THE REAR REFLECTED IRRADIANCE

Juan Lopez-Garcia [1], Alberto Casado[1], Tony Sample[1]

[1] European Commission, DG JRC, Directorate C - Energy, Transport and Climate, Energy efficiency and Renewables Unit, Italy

11:45 - 12:00 7MoO6.6

ANALYSIS OF CHANGE IN POWER GENERATION BY OUTDOOR EXPOSURE OF PHOTOVOLTAIC MODULES INSTALLED AT AIST KYUSHU CENTER FROM 2010 TO 2016

Yasuo Chiba [1], Ritsuko Sato[1], Sungwoo Choi[1], Tetsuyuki Ishii[2], Atsushi Masuda[1]

[1] National Institute of Advanced Industrial Science and Technology, Japan, [2] Central Research Institute of Electric Power Industry, Japan

Tuesday, November 14
8:30 - 10:00 Room 1+2

Chairpersons:
Area 1, Yoshio Ohshita *(Toyota Technological Institute)*
Area 3. Tatsuya Takamoto *(Sharp)*
Area 9. Kazuhiko Ogimoto *(The University of Tokyo)*

8:30 - 9:00 **1TuPl.1** **Area1**

[Plenary]

RECORD EFFICIENCY INDUSTRIAL SCREEN-PRINTED MULTICRYSTALLINE SILICON SOLAR CELL

Hao Jin [1)]

[1)] Jinko Solar Holdings Co., Ltd

9:00 - 9:30 **3TuPl.2** **Area3**

[Plenary]

HIGH EFFICIENCY PHOTOVOLTAICS ENABLED BY III-V MATERIALS

Frank Dimroth [1)]

[1)] Fraunhofer Institute for Solar Energy Systems ISE

9:30 - 10:00 **9TuPl.3** **Area9**

[Plenary]

THE VALUE OF RENEWABLE INTEGRATION STUDIES

Carlo Brancucci [1)]

[1)] National Renewable Energy Laboratory, United States

Tuesday, November 14
10:30 - 12:00 Room 1+2 **Area1**

1TuO1 Characterization 1

Chairpersons:
Noritaka Usami *(Nagoya University)*
Jan Schmidt *(Institute for Solar Energy Research Hamelin (ISFH))*

10:30 - 10:45 **1TuO1.1**

PHOTOLUMINESCENCE IMAGING AT UNIFORM EXCESS CARRIER DENSITY USING NON-UNIFORM ILLUMINATION

Yan Zhu [1)], Mattias K. Juhl[1)], Friedemann D. Heinz[2)], Martin C. Schubert[2)], Thorsten Trupke[1)], Ziv Hameiri[1)]

[1)] School of Photovoltaic and Renewable Energy Engineering, University of New South Wales, [2)] Fraunhofer ISE

10:45 - 11:00 **1TuO1.2**

DETAILED ANALYSIS OF CONTACT RESISTANCE INVESTIGATION USING PHOTOLUMINESCENCE TECHNIQUE IN A SOLAR CELL

Amit Singh Rajput [1,2)], Samuel Raj[1)], Johnson KC Wong[1)], Armin G. Aberle[1,2)]

[1)] Solar Energy Research Institute of Singapore (SERIS), Singapore, [2)] Department of Electrical and Computer Engineering, National University of Singapore, Singapore

11:00 - 11:15 **1TuO1.3**

UNCERTAINTY IN THE DETERMINATION OF LOCAL RECOMBINATION CURRENT DENSITIES

Hannes Höffler [1)], Sabrina Werner[1)], Andreas Brand[1)]

[1)] Fraunhofer Institute for Solar Energy Systems ISE

11:15 - 11:30 **1TuO1.4**

TRACKING AND VISUALLIZATION OF DISLOCATION GENERATION IN MULTICRYSTALLINE SILICON BY PHOTOLUMINESCENCE IMAGE PROCESSING

Yusuke Hayama [1)], Tetsuya Matsumoto[2)], Kentaro Kutsukake[3)], Isao Takahashi[1)], Hiroaki Kudo[2)], Noritaka Usami[1)]

[1)] Graduate School of Engineering, Nagoya University, Japan, [2)] Graduate School of Informatics, Nagoya University, Japan, [3)] Institute for Materials Research, Tohoku University, Japan

11:30 - 11:45 **1TuO1.5**

RELATIONSHIP BETWEEN LOCAL OXYGEN PRECIPITATION AND MINORITY CARRIER LIFETIME IN CZOCHRALSKI SILICON

Rabin Basnet [1)], Fiacre E. Rougieux[1)], Daniel Macdonald[1)]

[1)] Research School of Engineering, The Australian National University

11:45 - 12:00 **1TuO1.6**

DETERMINATION OF CARBON CONCENTRATION IN PHOSPHORUS-DOPED N-TYPE CZOCHRALSKI-GROWN Si CRYSTALS BY LIQUID-NITROGEN-TEMPERATURE PHOTOLUMINESCENCE AFTER ELECTRON IRRADIATION

Yoichiro Ishikawa [1)], Michio Tajima[1)], Hirotatsu Kiuchi[1)], Atsushi Ogura[1)], Keiji Miyamura[2)], Hirofumi Harada[2)], Koichi Kakimoto[2)]

[1)] Meiji University, [2)] Kyushu University

Tuesday, November 14
10:30 - 12:00 Room 3 **Area2**

2TuO4 Industry and Related Technologies

Chairpersons:
Takayuki Negami *(Panasonic Corporation)*
Roland Scheer *(Martin-Luther-Universität)*

10:30 - 11:00 2TuO4.1

[Invited]

PROGRESS IN HIGH EFFICIENCY CIGS SOLAR CELL AND MODULE RESEARCH AT SOLAR FRONTIER

Takuya Kato [1)]

[1)] Atsugi Research Center, Solar Frontier K.K.

11:00 - 11:15 2TuO4.2

CIGSSe MODULES OVER 18% EFFICIENCY WITH TUNABLE WIDE BAND GAP BUFFER LAYERS

Thomas Dalibor [1)], Maik Sode[1)], Rajneesh Verma[1)], Robert Lechner[1)], Michael Algasinger[1)], Thomas Niesen[1)], Patrick Eraerds[1)], Christian Schubbert[1)], Jörg Palm[1)], Alfons Weber[1)], Martin Fürfanger[1)], Matej Hála[1)], Marko Stölzel[1)]

[1)] AVANCIS GmbH

11:15 - 11:30 2TuO4.3

FLEXIBLE CU(IN,GA)SE2 BASED SOLAR CELLS USING MOLYBDENUM SUBSTRATE

Negar Naghavi [1,3)], Mishael Stanley[2,3)], Marie Jubault[2,3)], Fréderique Donsanti[2,3)], Daniel Lincot[1,3)]

[1)] CNRS, Institut R&D sur l'Energie Photovoltaïque (IRDEP), [2)] EDF – R&D, Institut R&D sur l'Energie Photovoltaïque (IRDEP), [3)] Institut Photovoltaïque d'Ile de France (IPVF)

11:30 - 11:45 2TuO4.4

NEW APPROACH FOR AN INDUSTRIAL LOW-TEMPERATURE ROLL-TO-ROLL CI(G)S DEPOSTION PROCESS

Nikolaus Weinberger [1)], David Stock[1)], Tim Kodalle[2)], Marc D. Heinemann[2)], Daniel Huber[3)], Martina Harnisch[3)], Maurizio Acciarri[4)], Christian A. Kaufmann[2)], Andreas Zimmermann[3)], Georg N. Strauss[1)], Slimane Ghodbane[3)]

[1)] University of Innsbruck, [2)] Helmholtz-Zentrum Berlin, [3)] Sunplugged GmbH, [4)] University Milano-Bicocca

11:45 - 12:00 2TuO4.5

NUMERICAL MODELING OF SHADING-INDUCED BREAKDOWN IN CIGS PHOTOVOLTAIC DEVICES

Marco Nardone [1)]

[1)] Department of Physics and Astronomy, Bowling Green State University

Tuesday, November 14
10:30 - 12:00 Room 5 Area5

5TuO7 Mechanism and dynamics

Chairpersons:
Shengzhong Frank Liu *(Dollian Institute of Chemical Physics, Chinese Academy of Science)*
Tsutomu Miyasaka *(Faculty of Biomedical Engineering, Toin University of Yokohama)*

10:30 - 10:45 5TuO7.1

DISSOCIATION OF GEMINATE CHARGE PAIRS IN ORGANO LEAD TRIHALIDE PEROVSKITES

Vidmantas Gulbinas [1)], Ramūnas Augulis[1)], Marius Franckevičius[1)], Vytautas Abramavičius[2)], Darius Abramavičius[2)], Shaik Mohammed Zakeeruddi[3)], Michael Grätzel[3)]

[1)] Center for Physical Sciences and Technology, Vilnius, Lithuania, [2)] Vilnius University, Faculty of Physics, Department of Theoretical Physics, Vilnius, Lithuania, [3)] Laboratory of Photonics and Interfaces, ISIC, Swiss Federal Institute of Technology (EPFL), Switzerland

10:45 - 11:00 5TuO7.2

TOWARDS HOT CARRIER PEROVSKITE SOLAR CELLS

Tze Chien Sum [1)], Mingjie Li[1)], Saikat Bhaumik[2)], Nripan Mathews[2,3)], Subodh Mhaisalkar[2,3)]

[1)] School of Physical and Mathematical Sciences, Nanyang Technological University, [2)] Energy Research Institute, NTU, [3)] School of Materials Science and Engineering, Nanyang Technological University

11:00 - 11:15 5TuO7.3

INTERFACE ENGINEERING, PHOTOEXCITED CARRIER DYNAMICS AND MECHANISM FOR IMPROVING PHOTOVOLTAIC PERFORMANCE OF PEROVSKITE SOLAR CELLS

Qing Shen [1,5)], Chao Ding[1)], Yuhei Ogomi[2,5)], Taro Toyoda[1,5)], Kenji Yoshino[3,5)], Takashi Minemoto[4,5)], Shuzi Hayase[2,5)]

[1)] Faculty of Informatics and Engineering, The University of Electro-Communications, [2)] Kyushu Institute of Technology, [3)] Miyazaki University, [4)] Ritsumeikan University, [5)] CREST, Japan Science and Technology Agency (JST)

11:15 - 11:30 5TuO7.4

Perovskite Solar Cells: Morphological Crystal Structure and Interface Architecture

Satoshi Uchida [1)], Ludmila Cojocaru[1)], V.V. Jayaweera[2)], Shoji Kaneko[2)], Jotaro Nakazaki[1)], Takaya Kubo[1)], Hiroshi Segawa[1)]

[1)] Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, [2)] SPD Laboratory, Inc.

11:30 - 11:45 5TuO7.5

STUDY ON THE THERMAL STABILITY OF THE CH3NH3PBX2 (X= BR, I) MIXED PEROVSKITE SOLAR CELLS

Zubair Ahmad[1)], Mansoor Ani Najeeb[1)], R. A. Shakoor[1)]

[1)] Center for Advanced Materials (CAM) Qatar University

11:45 - 12:00 5TuO7.6

A SPATIALLY SMOOTHED DEVICE MODEL FOR MESO-STRUCTURED PEROVSKITE SOLAR CELLS

Hansong Xue [1,2], Erik Birgersson[1], Rolf Stangl[1,2]

[1] National University of Singapore, [2] Solar Energy Institute of Singapore

Tuesday, November 14
13:30 - 15:30 Room 1+2 Area1

1TuO2 Noble Technologies, Hybrid

Chairpersons:
Shinsuke Miyajima *(Tokyo Institute of Technology)*
Kwanyong Seo *(Ulsan National Institute of Science and Technology (UNIST))*

13:30 - 13:45 1TuO2.1

PROGRESS WITH POLYMER/SILICON HETEROJUNCTION SOLAR CELLS

Jan Schmidt [1,2], Dimitri Zielke[1], Ralf Gogolin[1], Marc-Uwe Halbich[1], Rüdiger Sauer[3], Wilfried Lövenich[3]

[1] Department of Photovoltaics, Institute for Solar Energy Research Hamelin (ISFH), [2] Leibniz University Hanover, [3] Heraeus

13:45 - 14:00 1TuO2.2

CRYSTALLINE-SI HTEROJUNCTION WITH ORGANIC THIN-LAYER (HOT) SOLAR CELLS

Hajime Shirai [1], Koji Kasahara[1], Daisuke Harada[1], Tsutomu Hayashi[2], Jaker Hossain[1], Ryo Ishikawa[1]

[1] Graduate School of Science and Engineering, Saitama University, [2] K·I·S Co.Ltd.

14:00 - 14:15 1TuO2.3

TOWARDS THE INDUSTRIALISATION OF PEROVSKITE-SILICON TANDEM CELLS

Daniel Kirk [1]

[1] Oxford PV (UK) Ltd.

14:15 - 14:30 1TuO2.4

COLORED SOLAR MODULE USING AUTOMOTIVE PAINTINGS

Yuki Kudo [1], Debasish Banerjee[2], Taizo Masuda[1]

[1] Toyota Motor Corporation, [2] Toyota Motor Engineering & Manufacturing North America

14:30 - 14:45 1TuO2.5

<1G/W SOLAR CELLS ON FLEXIBLE SILICON SUBSTRATES

André Augusto [1], Pradeep Balaji[1], William Dauksher[1], Stuart G. Bowden[1]

[1] Electrical Engineering, Arizona State University

14:45 - 15:00 1TuO2.6

DEVELOPMENT OF 65 µm THIN FREE-STANDING Cz SILICON HETEROJUNCTION CELLS WITH Voc UP TO 749 mV

Shruti Jambaldinni [1], Twan Bearda[1], Joachim John[1], Michael Haslinger[1], Miha Filipic[1], Jinyoun Cho[1,2], Maarten Debucquoy[1], Ivan Gordon[1], Jozef Szlufcik[1], Jef Poortmans[1,2,3]

[1] imec, Belgium, [2] KU Leuven, Belgium, [3] U Hasselt, Belgium

15:00 - 15:15 1TuO2.7

NOVEL SILVER PASTE FOR N-TYPE BI-FACIAL PERT CELL

Kyotaro Nakamura [1], Kazuo Muramatsu[2], Noboru Yamaguchi[3], Yoshio Ohshita[4]

[1] Organization for the Strategic Coordination of Research and Intellectual Properties, Meiji University, [2] NAMICS CORPORATION, [3] ULVAC, Inc., [4] Toyota Technological Institute

15:15 - 15:30 1TuO2.8

EFFECTS OF CHEMICAL ROUNDING ON THE PERFORMANCE OF PYRAMID- TEXTURED P-TYPE EMITTERS PASSIVATED BY ALOX IN N-TYPE SI SOLAR CELLS

Hyunju Lee [1], Inseol Song[2], Sang-Won Lee[2], Sungeun Park[2], Soohyun Bae[2], Yoonmook Kang[2], Haeseok Lee[2], Donghwan Kim[2], Atsushi Ogura[3], Yoshio Ohshita[1]

[1] Toyota Technological Institute, [2] Korea University, [3] Meiji University

Tuesday, November 14
13:30 - 15:30 Room 3 Area3

3TuO5 High Efficiency multijunction

Chairpersons:
Angele Reinders *(University of Twente)*
Mitsuru Imaizumi *(Japan Aerospace Exploration Agency)*

13:30 - 14:00 3TuO5.1

[Invited]

HERITAGE TRIPLE JUNCTION III-V SOLAR CELLS EXCEEDING 31% EFFICIENCY

James H. Ermer [1], Chris M. Fetzer[1], Philip T. Chiu[1], Xingquan Liu[1], Moran Haddad[1], Jeffrey P. Krogen[1]

[1] Spectrolab, Inc., A Boeing Company

14:00 - 14:15 3TuO5.2

[Area Leading invited]

III-V THIN-FILM SOLAR CELL MODULES DEVELOPED FOR SPACE AND TERRESTRIAL ENVIRONMENT

Hiroshi Yamaguchi [1)], Hiroyuki Juso[1)], Kohsuke Ueda[1)], Hidetoshi Washio[1)], Tatsuya Takamoto[1)], Taishi Sumita[2)], Tetsuya Nakamura[2)], Mitsuru Imaizumi[2)]

[1)] Energy Solutions BU, Sharp corporation, [2)] Japan Aerospace Exploration Agency

14:15 - 14:30 3TuO5.3

STEP-TUNNEL InGaAs/GaAsP QUANTUM WELL SUPERLATTICE FOR 1.15-eV MIDDLE CELL IN 4-JUNCTION SOLAR CELL

Masakazu Sugiyama [1)], Takanori Usuki[2)], Kasidit Toprasertpong[2)], Kentaroh Watanabe[1)], Yoshiaki Nakano[1)]

[1)] Research Center for Advanced Science and Technology, The University of Tokyo, [2)] Department of Electrical Engineering and Information Systems, School of Engineering,The University of Tokyo

14:30 - 14:45 3TuO5.4

FABRICATION OF GAAS SOLAR CELLS GROWN WITH INGAP WINDOW LAYERS BY HYDRIDE VAPOR PHASE EPITAXY

Ryuji Oshima [1)], Kikuo Makita[1)], Akinori Ubukata[2)], Takeyoshi Sugaya[1)]

[1)] National Institute of Advanced Industrial Science and Technology, [2)] Taiyo Nippon Sanso Corporation

14:45 - 15:00 3TuO5.5

CHARACTERIZATION OF INVERTED GROWN LATTICE-MATCHING MULTIJUNCTION SOLAR CELLS WITH 1.0 EV DILUTE NITRIDE SUBCELL

Naoya Miyashita [1)], Takaaki Agui[2)], Hiroyuki Juso[2)], Tatsuya Takamoto[2)], Yoshitaka Okada[1)]

[1)] The University of Tokyo, [2)] Sharp Corporation

15:00 - 15:15 3TuO5.6

OUTPUT EVALUATION OF A WORLD'S HIGHEST EFFICIENCY FLAT SUB-MODULE WITH InGaP/GaAs/InGaAs INVERTED TRIPLE-JUNCTION SOLAR CELL UNDER OUTDOOR OPERATION

Yasuyuki Ota [1)], Kohsuke Ueda[2)], Tatsuya Takamoto[2)], Kensuke Nishioka[1)]

[1)] University of Miyazaki, [2)] Sharp Corporation

15:15 - 15:30 3TuO5.7

FLIGHT DEMONSTRATION OF IMM3J SPACE SOLAR CELL FILM IN SPACE

Taishi Sumita [1)], Yuichi Shibata[1)], Tetsuya Nakamura[1)], Kazunori Shimazaki[1)], Akio Kukita[1)], Mitsuru Imaizumi[1)], Takeshi Ohshima[2)], Shin-ichiro Sato[2)], Tatsuya Takamoto[3)]

[1)] Japan Aerospace Exploration Agency, [2)] National Institutes for Quantum and Radiological Science and Technoroly, [3)] Sharp corporation

Tuesday, November 14
13:30 - 15:30 Room 5 **Area9**

9TuO8 PV System Integration Including Smart Grid

Chairpersons:
Kazuhiko Ogimoto *(The University of Tokyo)*
Carlo Brancucci *(National Renewable Energy Laboratory)*

13:30 - 14:00 9TuO8.1

[Invited]

LESSONS LEARNED FROM RECENT DEMONSTRATIONS COMBINING PHOTOVOLTAIC GENERATION AND BATTERY STORAGE

Ben York [1)], Steven Coley[1)], Alex Magerko[1)], Cameron Riley[1)], Aminul Huque[1)]

[1)] Electric Power Research Institute (EPRI)

14:00 - 14:15 9TuO8.2

IMPACT ASSESSMENT OF SHORT-TERM FLUCTUATION OF HIGH PENETRATION PV POWER GENERATION ON POWER SYSTEM FREQUENCY CONTROL

Zhiping Tan [1)], Muneaki Kurimoto[1)], Yusuke Manabe[2)], Toshihisa Funabashi[2)], Takeyoshi Kato[2)]

[1)] Department of Electrical Engneering, Nagoya University, [2)] Institute of Materials and Systems for Sustainability, Nagoya University

14:15 - 14:30 9TuO8.3

REGIONAL PHOTOVOLTAICS POWER ESTIMATION USING A GEO-STATIONARY SATELLITE HIMAWARI-8

Hideaki Ohtake [1,2)], Fumichika Uno[1,2)], Takashi Oozeki[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology (AIST), JAPAN, [2)] Meteorological Research Institute, Japan Meteorological Agency (MRI-JMA) , Japan

14:30 - 14:45 9TuO8.4

INFLUENCE OF WRF RADIATION SCHEME ON PRECISION OF IRRADIANCE FORECASTING

Naoto Kai [1)], Muneaki Kurimoto[1)], Yusuke Manabe[1),] Toshihisa Funabashi[1)], Takeyoshi Kato[1)], Fumichika Uno[2)]

[1)] Nagoya University, Japan, [2)] National Institute of Advanced Science and Technology, Japan

14:45 - 15:00 9TuO8.5

ENERGY MANAGEMENT CONTROLLER FOR PHOTOVOLTAIC CHARGING STATION (PV-CS) IN ELECTRIC VEHICLE APPLICATION

Ayda Esfandyari [1)], Brian Norton[1)], Michael F. Conlon[1)], Sarah J. McCormack[2)]

[1)] Dublin Energy Lab, School of Electrical Engineering, Dublin Institute of Technology (DIT), [2)] Dept of Civil, Structural and Environmental Engineering, Trinity College Dublin (TCD)

15:00 - 15:15 9TuO8.6

DAY AHEAD PLANNING OF PV POWER GENERATION TO MINIMIZE IMBALANCE COST CONSIDERING SOLAR RADIATION FORECAST ERROR

Ayumu Iio [1)], Yuzuru Ueda[1)]

[1)] Department of Electrical Engineering, Tokyo University of Science

15:15 - 15:30 9TuO8.7

LINEAR COMBINATION OF DAY-AHEAD CHARGE/ DISCHARGE SCHEDULING TOWARD MULTI-OBJECTIVE ANALYSIS OF EMS

Takahiro Sasaki [1)], Jindan Cui[1)], Yuzuru Ueda[1)], Masakazu Koike[2)], Takayuki Ishizaki[3)], Jun-ichi Imura[3)]

[1)] Tokyo University of Science, Japan, [2)] Tokyo University of Marine Science and Technology, Japan, [3)] Tokyo Institute of Technology, Japan

Tuesday, November 14
18:30 - 20:00 Room 1+2 Area8

8TuO3 Emerging Technologies

Chairpersons:
Takashi Oozeki *(National Institute of Advanced Industrial Science and Technology (AIST))*
John Ogawa Borland *(J.O.B. Technologies)*

18:30 - 18:45 8TuO3.1

[Area Leading invited]

Photovoltaic power systems deployment for half a century and our technical contribution in Asia

Yousuke Nozaki [1)], Kazuhiko Oda[1)], Kensuke Murai[1)], Keiichiro Hakuta[1)], Yuji Kawagoe[1)]

[1)] Smart Energy Business Headquarters, NTT FACILITIES, Inc

18:45 - 19:00 8TuO3.2

[Area Leading invited]

PV MODULE REUSE & RECYCLING BUSINESS AND MODULE DEFECTS IN THE FIELD

Masafumi Ito [1)], Taisuke Doi[1)]

[1)] NPC Incorporated

19:00 - 19:15 8TuO3.3

DEVELOPMENT OF HIGH PRECISION FAULT DETECTION METHOD OF LARGE-SCALE PV USING PV STRING MEASUREMENT DATA

Takuro Kida [1)], Yuzuru Ueda[1)], Yoshinori Inoue[2)], Tatsuhiko Konuma[3)]

[1)] Tokyo University of Science, [2)] Fuji Electric Co., Ltd, [3)] BroadBand Tower, Inc.

19:15 - 19:30 8TuO3.4

FIELD EXPERIENCE AND PERFORMANCE ANALYSIS OF FLOATING PV TECHNOLOGIES IN THE TROPICS

Haohui Liu [1)], Lu Zhao[1)], Jason Lun Leung[1)], Vijay Anand Krishna[1)], Thomas Reindl[1)]

[1)] Solar Energy Research Institute of Singapore (SERIS)

19:30 - 19:45 8TuO3.5

ALL-BLACK FRONT SURFACES FOR BUILDING-INTEGRATED PHOTOVOLTAICS

Beniamino Iandolo [1)], Io Mizushima[2)], Rasmus S. Davidsen[1)], Peter T. Tang[2)], Ole Hansen[1)]

[1)] DTU nanotech, Technical University of Denmark, [2)] IPU, Denmark

19:45 - 20:00 8TuO3.6

ELECTROSTATIC CLEANING EQUIPMENT FOR REMOVAL OF DUST FROM SOLAR PANELS

Hiroyuki Kawamoto [1)]

[1)] Department of Applied Mechanics and Aerospace Engineering, Waseda University

Tuesday, November 14
18:30 - 20:00 Room 3 Area2

2TuO6 Device Characterization and TCO

Chairpersons:
Shogo Ishizuka *(AIST)*
Thomas Dalibor *(R&D, AVANCIS GmbH)*

18:30 - 18:45 2TuO6.1

CRITICAL ROLE OF LIGHT EXPOSURE ON CO-EVAPORATED Cu(In,Ga)Se2 SOLAR CELLS

Roland Scheer [1)], Torsten Hoelscher[1)], Matthias Maiberg[1)]

[1)] Institute of Physics, Martin-Luther-Universität, Germany

18:45 - 19:00 2TuO6.2

THE ORIGIN AND PROPAGATION OF REVERSE BIAS INDUCED DEFECTS IN CIGS PHOTOVOLTAIC DEVICES

Harvey L. Guthrey [1)], Steve Johnston[1)], Elizabeth Palmiotti[2)], Andreas Gerber[3)], Mowafak Al-Jassim[1)]

[1)] Analytical Microscopy Group, National Renewable Energy Laboratory, [2)] Colorado School of Mines, [3)] IEK5-Forshungszentrum Jülich GMBH

19:00 - 19:15 2TuO6.3

ANALYSIS OF RECOMBINATION RATES IN CU(IN,GA)(S,SE)2-BASED SOLAR CELLS WITH CDS, ZNS(O,OH), AND (CD,ZN)S BUFFER LAYERS

Jakapan Chantana [1)], Takuya Kato[2)], Hiroki Sugimoto[2)], Takashi Minemoto[1)]

[1)] Department of Electrical and Electronic Engineering, Ritsumeikan University, [2)] Solar Frontier K. K.

19:15 - 19:30 2TuO6.4

EFFECT OF CESIUM FLUORIDE POST-DEPOSITION TREATMENT ON THIN FILM CU(IN,GA)SE2 SOLAR CELLS: SELF-ADJUSTMENT AND INTERFACIAL ENGINEERING AT CIGS/CDS INTERFACE

Tzu-Ying Lin [1,2)], Ishwor Khatri[2)], Kosuke Shudo[2)], Wei-Chih Huang[1)], Mutsumi Sugiyama[2)], Chih-Huang Lai[1)], Tokio Nakada[2)]

[1)] Department of Materials Science and Engineering, National Tsing Hua University, [2)] Research Institute of Science and Technology, Tokyo University of Science

19:30 - 19:45 2TuO6.5

CHALLENGES OF AN HYDROGEN DOPED INDIUM OXIDE WINDOW LAYER IN CIGS MODULES

Darja Erfurt [1)], Marc Daniel Heinemann[1)], Stefan Körner[2)], Bernd Szyszka[2)], Reiner Klenk[1)], Rutger Schlatmann[1)]

[1)] PVcomB Helmholtz-Zentrum Berlin, Germany, [2)] Technical University of Berlin, Germany

19:45 - 20:00 2TuO6.6

SURFACE MODIFICATION OF FTO BY PLASMA ION IMPLANTATION FOR THE APPLICATION ON CDTE SOLAR CELLS

Cai Liu [1)], Peng Tang[1)], Jingquan Zhang[1)], Lili Wu[1)], Wei Li[1)], Lianghuan Feng[1)]

[1)] College of Materials Science and Engineering, Sichuan University

Tuesday, November 14
18:30 - 20:00 Room 5 **Area6**

6TuO9 Quantum Well Solar Cells and Up/down Conversion

Chairpersons:
Nowshad Amin *(The National University of Malaysia)*
Shuhei Yagi *(Saitama University)*

18:30 - 18:45 6TuO9.1

[Area Leading invited]

NOVEL MICRO CPV MODULE INTEGRATED WITH PLASTIC LENS, CIRCUIT BOARD AND III-V COMPOUND SEMICONDUCTOR UTILIZING INJECTION MOLDING AND SURFACE MOUNTING

Michihiko Takase [1)], Youichirou Aya[1)], Nobuhiko Hayashi[1)], Shutetsu Kanayama[1)], Hikaru Nishitani[1)], Bunji Mizuno[1)]

[1)] Special Project Office, Production Engineering Center Connected Solutions Company, Panasonic Corporation

18:45 - 19:00 6TuO9.2

BROADBAND-SENSITIVE UPCONVERSION OF Er^{3+}, Ni^{2+}-CO-DOPED GARNETS

Yasuhiko Takeda [1)], Hom Nayh Luitel[1)], Shintaro Mizuno[1)]

[1)] Toyota Central Research and Development Laboratories, Inc.

19:00 - 19:15 6TuO9.3

ECO-FRIENDLY CUGAS2/ZNS QUANTUM DOTS HARVESTING UV-LIGHT AND EMITTING A WIDE RANGE OF VISIBLE LIGHT WITH HIGHLY PHOTOLUMINESCENCE QUANTUM YIELD FOR ENHANCING THE PERFORMANCE OF SOLAR CELLS

Mohammed Jalalah [1,2)], Yun-Hyuk Ko[1)], Seung-Jae Lee[1)], Ji-Eun Lee[1)], Jea-Gun Park[1)]

[1)] Hanyang University, [2)] Najran University

19:15 - 19:30 6TuO9.4

INVESTIGATION OF CARRIER TRANSPORT MECHANISM IN SUPERLATTICE SOLAR CELLS WITH STRAIN RELAXATION LAYER

Hideaki Takeda [1)], Tsubasa Nakamura[1)], Jianan Lu[1)], Hidetoshi Suzuki[1)], Kasidit Toprasertpong[2)], Masakazu Sugiyama[2)], Tetsuo Ikari[1)], Atsuhiko Fukuyama[1)]

[1)] Faculty of Engineering, University of Miyazaki, [2)] The University of Tokyo

19:30 - 19:45 6TuO9.5

THIN-FILM MULTIPLE QUANTUM WELLS SOLAR CELLS FABRICATED BY EPITAXIAL LIFT OFF PROCESS

Tatsuya Nakata [1)], Kentaroh Watanabe[2)], Naoya Miyashita[2)], Hassanet Sodabanlu[2)], Yoshiaki Nakano[1,2)], Yoshitaka Okada[1,2)], Masakazu Sugiyama[1,2)]

[1)] School of Engineering, University of Tokyo, [2)] Research Center for Advanced Science and Technology, University of Tokyo

19:45 - 20:00 6TuO9.6

ELECTROLUMINESCENCE AND RECIPROCITY RELATION IN MULTIPLE QUANTUM WELL SOLAR CELLS

Kasidit Toprasertpong [1)], Amaury Delamarre[1)], Kentaroh Watanabe[1)], Yoshiaki Nakano[1)], Jean-François Guillemoles[2)], Masakazu Sugiyama[1)]

[1)] The University of Tokyo, [2)] Institute for Research and Development on Photovoltaic Energy

Wednesday, November 15
8:30 - 10:00 Room 1+2

Chairpersons:
Area 4. Masahiro Hiramoto *(Institute for Molecular Science)*
Area 5. Shuzi Hayase *(Kyushu Institute of Technology)*
Area 8. Yuzuru Ueda *(Tokyo University of Science)*

8:30 - 9:00 4WePl.1

[Plenary]

REDUCTION OF PHOTON ENERGY LOSS IN POLYMER SOLAR CELLS

Itaru Osaka [1)]

[1)] Department of Applied Chemistry, Hiroshima University

9:00 - 9:30 5WePl.2

[Plenary]

21 Century Disruptive Photovoltaics: Perovskite Solar Cell

Nam-Gyu Park [1)]

[1)] School of Chemical Engineering, Sungkyunkwan University

9:30 - 10:00 8WePl.3

[Plenary]

TOWARDS NEW MOBILITY SOCIETY BY USING SOLAR ENERGY

Masaki Nakaoka [1)], Taizo Masuda[1)], Kazutaka Kimura[1)], Akinori Sato[1)]

[1)] Future Project Div., Frontier Research Center, TOYOTA MOTOR CORPORATION

Wednesday, November 15
10:30 - 12:00 Room 1+2 **Area8**

8WeO1 Smart Systems

Chairpersons:
Robert Höller *(University of Applied Science Upper Austria)*
Masakazu Ito *(Waseda University)*

10:30 - 11:00 8WeO1.1

[Invited]

REALIZATION OF NEXT GENERATION ENERGY SOCIAL SYSTEM THROUGH COLLABORATION, CASE STUDY OF FUJISAWA SST

Ryuzo Hagihara [1)]

[1)] Eco solutions company of Panasonic Group, Panasonic

11:00 - 11:15 8WeO1.2

A CASE STUDY FOR ACHIEVING 100% RESIDENTIAL HAWAII HOME ENERGY NEEDS WITH RENEWABLES BY OPTIMIZING ROOFTOP SOLAR PV AND HOT WATER WITH ELECTRICAL AND THERMAL (HOT&COLD) BATTERY STORAGE INTEGRATION

John O. Borland [1)], Takahiro Tanaka[2)], Harumi McClure[2)], Jay Moore[3)], Corpuz Poncho[3)]

[1)] J.O.B. Technologies, [2)] Tabuchi Electric, [3)] Poncho's Solar

11:15 - 11:30 8WeO1.3

EV SOLAR STATION, A KEY INFRUSTRUCTURE FOR ABSORBING SURPRASS ENERGY GENERATION OF PV ON THE CAR-ROOF

Kenji Araki [1)], Kan-Hua Lee[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute

11:30 - 11:45 8WeO1.4

ADVANCED MODELLING OF ENVIRONMENT INTEGRATED PV SYSTEMS: FROM LOCATION TO LOAD

Rudi Santbergen [1)], Olindo Isabella[1)], Miro Zeman[1)]

[1)] Photovoltaic Materials and Devices Laboratory, Delft University of Technology

11:45 - 12:00 8WeO1.5

DEVELOPMENT OF AN AUTOMATIC FAILURE DETECTION ALGORITHM FOR RESIDENTIAL PV SYSTEM BY USING OPI METHOD

Masato Ajisaka [1)], Yuzuru Ueda[1)], Tomoyoshi Yokota[2)], Ryuuji Yamada[2)]

[1)] Department of Electrical Engineering, Tokyo University of Science, [2)] Kyocera Coorporation

Wednesday, November 15
10:30 - 12:00 Room 3 Area2

2WeO3 CZTS Devices

Chairpersons:
Shigeru Ikeda *(Konan University)*
Susanne Siebentritt *(University of Luxembourg)*

10:30 - 10:45 2WeO3.1

CHARACTERRIZATION OF CU2ZNSNSE4 SOLAR CELL WITH CONVERSION EFFICIENCY OF 11.7%

Hitoshi Tampo [1)], Shinho Kim[1)], Hajime Shibata[1)], Shigeru Niki[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

10:45 - 11:00 2WeO3.2

Characterization of the Cu2ZnSn(SXSe1-X)4(CZTSSe) absorber thin films deposited by a sputtering process

Myeng Gil Gang [1)], Jin Hyeok Kim[2)]

[1)] Optoelectronic Convergence Research Center, Department of Materials Science and Engineering, Chonnam National University, South Korea

11:00 - 11:15 2WeO3.3

A COMPARATIVE STUDY OF LIGANDS IN Cu2ZnSn(S,Se)4 SOLAR CELLS PREPARED FROM NANOPARTICLE INKS

Yongtao Qu [1)], Neil S. Beattie[1)], Guillaume Zoppi[1)]

[1)] Department of Mathematics, Physics and Electrical Engineering, Ellison Building, Northumbria University

11:15 - 11:30 2WeO3.4

SURFACE TREATMENT EFFECT ON Cu2ZnSn(S,Se)4 SOLAR CELLS

Takuya Ebi [1)], Kanta Sugimoto[1)], Naoki Suyama[1)], Kazuyoshi Nakada[1)], Akira Yamada[1)]

[1)] Tokyo Institute of Technology

11:30 - 11:45 2WeO3.5

CZTSE: GE SOLAR CELLS FABRICATION FROM MBE-DEPOSITED METALLIC STACK PRECURSORS

Sergio Giraldo[1)], Shino Kim[2)], Hitoshi Tampo[2)], Hajime Shibata[2)], Alejandro Pérez-Rodríguez[1)], Edgardo Saucedo [1)]

[1)] Catalonia Institute for Energy Research (IREC), [2)] National Institute of Advanced Industrial Science and Technology (AIST)

11:45 - 12:00 2WeO3.6

ANNEALING EFFECT AFTER CdS LAYER DEPOSITION ON Cu2ZnSn(S,Se)4 SOLAR CELLS

Kanta Sugimoto [1)], Takuya Ebi[1)], Naoki Suyama[1)], Kazuyoshi Nakada[1)], Akira Yamada[1)]

[1)] Tokyo Institute of Technology

Wednesday, November 15
10:30 - 12:00 Room 5 Area4

4WeO5 Organic and Dye-Sensitized Solar Cells 1

Chairpersons:
Masahiro Hiramoto *(Institute for Molecular Science)*
Sergei Manzhos *(National University of Singapore)*

10:30 - 11:00 4WeO5.1

[Invited]

PV FOR INDOOR USE AND ITS STANDARDIZATION

Shinji Aramaki [1)]

[1)] Research Division, CEREBA

11:00 - 11:15 4WeO5.2

Π-CONJUGATION EFFECTS OF OLIGO(THIENYLENEVINYLENE) SIDE CHAINS IN SEMICONDUCTING POLYMERS ON PHOTOVOLTAIC PERFORMANCE

Keisuke Tajima [1)], Jianming Huang[1)]

[1)] RIKEN Center for Emergent Matter Science (CEMS)

11:15 - 11:30 4WeO5.3

ORGANIC SOLAR CELLS UTILIZING NON-PERIPHERAL OCTAHEXYLPHTHALOCYANINE AND ITS ANALOGUES

Akihiko Fujii[1)], Quang Duy Dao [1)], Makoto Yoneya[2)], Yo Shimizu[2)], Masanori Ozaki[1)]

[1)] Division of Electrical, Electronic and Information Engineering, Osaka University, [2)] National Institute of Advanced Industrial Science and Technology

11:30 - 11:45 4WeO5.4

IMPROVED Voc IN SMALL MOLECULE ORGANIC SOLAR CELLS WITHOUT CONCOMMITANT DECREASE IN Jsc

James W. Ryan [1)]

[1)] International Center for Young Scientists, National Institute for Materials Science

11:45 - 12:00 4WeO5.5

μM-THICK VACUUM DEPOSITED PTHALOCYANINE :C60 PHOTOVOLTAIC CELLS UTILIZING CO-EVAPORANT INDUCED CRYSTALLIZATION

Toshihiko Kaji [1)]

[1)] Department of Applied Physics, Tokyo University of Agriculture and Technology

Wednesday, November 15
10:30 - 12:00 Room 6 Area5
5WeO7 High Performance (Durability etc)

Chairpersons:
Tae Woong Kim *(University of Tokyo)*
Satoshi Uchida *(University of Tokyo)*

10:30 - 10:45 5WeO7.1

MIXED METAL PEROVSKITE CONSISTING OF TIN WITH LOW VOLTAGE LOSS

Shuzi Hayase [1)], Yuhei Ogomi[1)], Daiki Yamasuso[1)], Kengo Hamada[1)], Yuuma Hoshiba[1)], Shen Qing[2)], Taro Toyoda[2)], Kenji Yoshino[3)], Takashi Minemoto[4)], Hiroshi Segawa[5)]

[1)] School of Lif Science and Systems Engineering, Kyushu National Insitutute of Technology, [2)] Univerisity of Electro-communications, [3)] Miyazaki University, [4)] Ritsumeikan University, [5)] The University of Tokyo

10:45 - 11:00 5WeO7.2

TANDEM DYE-SENSITIZED/PEROVSKITE SOLAR CELLS

Marina Vildanova [1)], Anna Nikolskaia[1)], Sergey Kozlov[1)], Liudmila Larina[1,2)], Nikolay Tsvetkov[1,2)]

[1)] Solar Photovoltaic Laboratory, Institute of Biochemical Physics RAS, [2)] Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology

11:00 - 11:15 5WeO7.3

MICROWAVE IRRADIATION FOR ORGANIC-INORGANIC HYBRID LEAD HALIDE CRYSTALLIZATION APPLIED TO PEROVSKITE SOLAR CELLS

Masato Maitani [1)], Vijay S. Murugesan[1)], Daikichi Iso[2)], Junbeom Kim[2,3)], Shuntaro Tsubaki[2)], Tsutomu Miyasaka[4)], Hiroshi Segawa[1)], Yuji Wada[2)]

[1)] The University of Tokyo, [2)] Tokyo Institute of Technology, [3)] Seoul National University, [4)] Toin University of Yokohama

11:15 - 11:30 5WeO7.4

HIGH STABILITY OF SEMI-TRANSPARENT PEROVSKITE SOLAR CELLS SHOWING NO DEGRADATION OVER 1000 HOURS OF CONTINUOUS OPERATION

Yasuhiro Shirai [1)], Md Bodiul Islam[1)], Masatoshi Yanagida[1)], Kenjiro Miyano[1)]

[1)] National Institute for Materials Science

11:30 - 11:45 5WeO7.5

Direct observation of phase coexistence and microstructural configuration of the organometal halide perovskite solar cell

Tae Woong Kim [1)], Satoshi Uchida[1)], Tomonori Matsushita[1)], Ludmila Cojocaru[1)], Takashi Kondo[1)], Hiroshi Segawa[1)]

[1)] Univ. of Tokyo, Japan

11:45 - 12:00 5WeO7.6

[Area Leading Invited]

METAL OXIDE AND LOW TEMPERATURE PROCESS BASED PEROVSKITE SOLAR CELLS AND HIGH EFFICIENCY DEVELOPMENT

Tsutomu Miyasaka [1)]

[1)] Toin University of Yokohama

Wednesday, November 15
13:30 - 14:45 Room 1+2 **Area1**

1WeO2 Crystal Growth and Wafering

Chairpersons:
Stefan W.Glunz *(Fraunhofer Institute for Solar Energy Systems)*
Koji Arafune *(University of Hyogo)*

13:30 - 13:45 1WeO2.1

Recent Progress and Challenges of Cast Silicon for Photovoltaic Industry

Chung Wen Lan [1)], A. Lan[1,2)], C.F. Yang[1)], H.P. Hsu[1)], M. Yang[2)], A. Yu[2)], B. Hsu[2)], C. Hsu[2)], A. Yang[3)]

[1)] Department of Chemical Engineering, National Taiwan University, [2)] Sino-American Silicon Products Inc. (SAS), [3)] Solartech Energy Inc.

13:45 - 14:00 1WeO2.2

METAL PRECIPITATE DISTRIBUTIONS IN HIGH-PERFORMANCE AND CONVENTIONAL MULTICRYSTALLINE SILICON

Mallory Jensen[1)], Sarah Wieghold[1)], Kai E. Ekstrøm[2)], Antoine Autruffe[2)], Amanda Youssef [1)], Erin E. Looney[1)], Juan-Pablo Correa-Baena[1)], Jeremy Poindexter[1)], Gaute Stokkan[3)], Barry Lai[4)], Tonio Buonassisi[1)]

[1)] Massachusetts Institute of Technology, [2)] Norwegian University of Science and Technology, [3)] SINTEF, [4)] Argonne National Laboratory

14:00 - 14:15 1WeO2.3

CONTROL OF CRUCIBLE MOVEMENT ON MELTING PROCESS AND CARBON CONTAMINATION IN CZOCHRALSKI SILICON CRYSTAL GROWTH

Xin Liu [1)], Xue-Feng Han[1)], Satoshi Nakano[1)], Koichi Kakimoto[1)]

[1)] Research Institute for Applied Mechanics, Kyushu University

14:15 - 14:30 1WeO2.4

COMBINING THE ULTRA SIMPLIFIED SOLENNA 3 CELL CONCEPT WITH N-TYPE CRYSTALMAX SILICON

Raphaël Cabal [1)], Bernadette Grange[1)], Lotfi Bounaas[2)], Sébastien Dubois[1)]

[1)] CEA, LITEN, INES, [2)] ECM Green Tech

14:30 - 14:45 1WeO2.5

PERFORMANCE OF DIAMOND SAWING MULTI-CRYSTALLINE SILICON WAFER AND CELL

Longfei Gong[1,2)], Xuegong Yu[1)], Shanming Jin[2)], Deren Yang [1,2)]

[1)] School of Materials Science & Engineering, Zhejiang University, [2)] Suzhou GCL Photovoltaic Technology Co., Ltd.

Wednesday, November 15
13:30 - 14:45 Room 3 **Area2**

2WeO4 New Materials and Concept

Chairpersons:
Mutsumi Sugiyama *(Tokyo University of Science)*
Negar Naghavi *(CNRS)*

13:30 - 13:45 2WeO4.1

[Area Leading invited]

RECENT PROGRESS IN HIGH EFFICIENCY PURE SULFIDE CIGS SOLAR CELLS

Hiroki Sugimoto [1)], Homare Hiroi[1,2)], Yasuaki Iwata[1)], Akira Yamada[2)]

[1)] Atsugi Research Center, Solar Frontier K.K., [2)] Tokyo Institute of Technology

13:45 - 14:00 2WeO4.2

EFFECT OF SB-DOPED N+-BASI2 SURFACE LAYER ON THE CARRIER TRANSPORT PROPERTIES AND SPECTRAL RESPONSE

Komomo Kodama [1)], Ryota Takabe[1)], Kaoru Toko[1)], Takashi Suemasu[1)]

[1)] Institute of Applied Physics, University of Tsukuba

14:00 - 14:15 2WeO4.3

FORMATION OF A NOVEL MG-P-ZN TERNARY SEMICONDUCTOR: A KEY MATERIAL OF EFFICIENCY ENHANCEMENT IN Zn3P2-BASED SOLAR CELLS

Ryoji Katsube [1)], Kenji Kazumi[1)], Yoshitaro Nose[1)]

[1)] Kyoto University, Japan

14:15 - 14:30 2WeO4.4

OPTIMIZATION OF THE RECOMBINATION JUNCTION IN MONOLITHIC TWO-TERMINAL HYBRID CIGS TANDEM DEVICES

Johan Blanker [1)], Yi Hsiu Liu[1)], Zeger Vroon[2)], Miro Zeman[1)], Arno Smets[1)]

[1)] Delft University of Technology, [2)] TNO/Solliance

14:30 - 14:45 2WeO4.5

A CORRELATIVE MICROSCOPY APPROACH TO DELINEATE THE IMPACT OF STRUCTURAL DEFECTS ON THE LOW MINORITY CARRIER LIFETIME IN TIN SULFIDE THIN FILMS

Amanda Youssef [1)], Rupak Chakraborty[1)], Paul Rekemeyer[1)], Austin Akey[2)], Silvija Gradečak[1)], Tonio Buonassisi[1)]

[1)] Massachusetts Institute of Technology, [2)] Harvard Center for Nanoscale Systems

Wednesday, November 15
13:30 - 14:45 Room 5 **Area4**

4WeO6 Organic and Dye-Sensitized Solar Cells 2

Chairpersons:
Keisuke Tajima *(RIKEN)*
Anna Nikolskaia *(Institute of Biochemical Physics, RussianAcademy of Sciences)*

13:30 - 13:45 4WeO6.1

IMPROVED CONVERSION EFFICIENCY OF 10% FOR SOLID-STATE DYE SENSITIZED SOLAR CELLS USING P-TYPE CUI

Naohiko Kato [1)], Shinya Moribe[1)], Masahito Shiozawa[1)], Kazuo Higuchi[1)], Akira Suzuki[2)], Katsuya Tsuchimoto[2)], Kouji Tatematsu[3)], Katsuyoshi Mizumoto[3)], Shouichi Doi[3)], Tatsuo Toyoda[3)], Ryo Suzuki[1)], Mareedu Sreenivasu[2)]

[1)] Energy Conversion Materials Lab. Toyota Central Research and Development Laboratories, [2)] AISIN Cosmos R&D Co.,Ltd., [3)] AISIN SEIKI Co., Ltd.

13:45 - 14:00 4WeO6.2

DESIGN OF SEMICONDUCTING POLYMERS TOWARDS HIGHLY THERMALLY STABLE SOLAR CELLS

Masahiko Saito [1)], Itaru Osaka[1)], Yasuhito Suzuki[1)], Kazuo Takimiya[2)], Takashi Okabe[3)], Satoru Ikeda[3)], Tsuyoshi Asano[3)]

[1)] Graduate School of Engineering, Hiroshima University, [2)] RIKEN Center for Emergent Matter Science, [3)] JX Nippon Oil & Energy Corporation

14:00 - 14:15 4WeO6.3

Cold Isostatic-Pressured Silver Nanowire Electrodes for Flexible Organic Solar Cells via Room-Temperature Processes

Ji Hoon Seo [1)], Inchan Hwang[1)], Han-Don Um[1)], Sojeong Lee[1)], Kangmin Lee[1)], Jeonghwan Park[1)], Hyeonoh Shin[2)], Tae-Hyuk Kwon[2)], Seok Ju Kang[1)], Kwanyong Seo[1)]

[1)] Department of Energy Engineering Ulsan National Institute of Science and Technology (UNIST), [2)] Department of Chemistry, Ulsan National Institute of Science and Technology (UNIST),

14:15 - 14:30 4WeO6.4

INDUCED CRYSTALLIZATION OF ORGANIC SEMICONDUCTOR IN THIN FILM BY SURFACE SEGREGATED MONOLAYERS

Seiichiro Izawa [1,2)], Kyohei Nakano[3)], Kaori Suzuki[3)], Yujiao Chen[3)], Tomoka Kikitsu[3)], Daisuke Hashizume[3)], Tomoyuki Koganezawa[4)], Thuc-Quyen Nguyen[5)], Keisuke Tajima[3)]

[1)] Institute for Molecular Science, [2)] The Graduate University for Advanced Studies (SOKENDAI), [3)] RIKEN Center for Emergent Matter Science (CEMS), [4)] Japan Synchrotron Radiation Research Institute (JASRI), [5)] University of California, Santa Barbara

14:30 - 14:45 4WeO6.5

COMPARATIVE COMPUTATIONAL STUDY OF FULLERENE DERIVATIVES: EFFECTS DUE TO FULLERENE SIZE, ADDENDS, AND CRYSTALLINITY ON BANDSTRUCTURE, CHARGE TRANSPORT AND OPTICAL PROPERTIES

Sergei Manzhos [1)], Amrita Pal[1)], Lai Kai Wen[1)], Chia Yao Jun[1)], Il Jeon[2)], Yutaka Matsuo[2)]

[1)] Department of Mechanical Engineering, National University of Singapore, [2)] University of Tokyo

Wednesday, November 15
13:30 - 14:45 Room 6 **Area7**

7WeO8 Module Materials

Chairpersons:
Keisuke Ohdaira *(Japan Advanced Institute of Science and Technology)*
Sarah Kurtz *(University of California, Merced)*

13:30 - 13:45 7WeO8.1

[Area Leading invited]

IMPACT OF PERC SOLAR CELL REAR METALLIZATION ON PV MODULE RELIABILITY

Marwan Dhamrin [1)], Shota Suzuki[1)], Naoya Morishita[1)], Masahiro Nakahara[1)], Yoshiki Hashizume[1)], Zenya Ashitaka[1)], Tsuji Kosuke[1)]

[1)] Core Technology Center Tokyo Aluminium K.K

13:45 - 14:00 7WeO8.2

ELECTRICAL IDENTIFICATION OF "AGING SIGNATURE" IN CRYSTALLINE SILICON PHOTOVOLTAIC MODULES EXPOSED IN FIELD FOR LONG-TERM

Tadanori Tanahashi [1)], Norihiko Sakamoto[1)], Hajime Shibata[1)], Atsushi Masuda[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology (AIST)

14:00 - 14:15 7WeO8.3

ADHESION DEGRADATION OF THE METALLIZATION-ENCAPSULANT INTERFACE

Nick S. Bosco [1)], Peter Hacke[1)], Sarah R. Kurtz[1)], Jared Tracy[2)], Reinhold H. Dauskardt[2)]

[1)] National Renewable Energy Laboratory, [2)] Stanford University

14:15 - 14:30 7WeO8.4

LOSS ANALYSIS AND DESIGN OPTIMIZATION OF SHINGLED BIFACIAL PHOTOVOLTAIC MODULES

Jai Prakash Singh [1)], Yan Wang[1)], Yong Sheng Khoo[1)]

[1)] Solar Energy Research Institute of Singapore, National University of Singapore

14:30 - 14:45 7WeO8.5

CONCEPTS FOR PV MODULES OPTIMIZED FOR DIFFERENT CLIMATIC CONDITIONS: BACKSHEETS AND ENCAPSULANTS

Gernot Oreski [1)], Antonia Mihaljevic[1)], Gabriele C. Eder[2)], Lukas Neumaier[3)], Christina Hirschl[3)], Rita Ebner[4)], Michael Edler[5)], Werner Krumlacher[5)]

[1)] Polymer Competence Center Leoben, [2)] Österreichisches Forschungsinstitut für Chemie und Technik, [3)] Carinthian Tech Research, [4)] Austrian Institute of Technology, [5)] Isovoltaic AG

Thursday, November 16
8:30 - 10:00 Room 1+2

Chairpersons:
Area 2. Hajima Shibata *(National Institute of Advanced Industrial Science and Technology)*
Area 6. Yoshitaka Okada *(The University of Tokyo)*
Area 7. Yoshihiro Hishikawa *(National Institute of Advanced Industrial Science and Technology)*

8:30 - 9:00 2ThPl.1 **Area2**

[Plenary]

CIGS SOLAR CELLS WITH ABOVE 22% EFFICIENCY:CHARACTERISTICS AND HIGHLIGHTS

Michael Powalla [1)], Stefan Paetel[1)], Theresa Magorian Friedlmeier[1)]

[1)] Zentrum für Sonnenenergie- und Wasserstoff-Forschung Baden-Wrttemberg (ZSW)

9:00 - 9:30 6ThPl.2 **Area6**

[Plenary]

New approaches for Beyond-Silicon Photovoltaics

Harry A. Atwater [1)]

[1)] California Institute of Technology

9:30 - 10:00 7ThPl.3 **Area7**

[Plenary]

A PERSPECTIVE ON THE WHOLE LIFE CYCLE OF PV MODULES

Donghwan Kim [1,2)], Hae-Seok Lee[2)], Yoonmook Kang[2)], Soohyun Bae[1)], Hyomin Park[1)], Se Jin Park[1)], Jeongeui Hong[3)], Wonwook Oh[4)], Nochang Park[4)], Sung Hyun Kim[4)]

[1)] Department of Materials Science and Engineering, Korea University, [2)] KU-KIST GreenSchool, Graduate School of Energy and Environment, Korea University, [3)] Hanwha-Q Cells Korea, [4)] Korea Electronics Technology Institute (KETI)

Thursday, November 16
10:30 - 12:00 Room 1+2 **Area1**

1ThO1 Characterization II

Chairpersons:
Atsushi Ogura *(Meiji University)*
Donghwan Kim *(Korea University)*

10:30 - 10:45 1ThO1.1

[Area Leading invited]

CRYSTAL GROWTH AND EVALUATION OF ULTRA-LONG CARRIER LIFETIME CZOCHRALSKI SILICON

Yuta Nagai [1)], Satoko Nakagawa[1)], Hiroyuki Tsubota[1)],

Hisashi Matsumura[1)]

[1)] GlobalWafers Japan Co., Ltd.

10:45 - 11:00 1ThO1.2

IMPROVED UNDERSTANDING OF LIGHT-INDUCED DEGRADATION AND REGENERATION IN MULTICRYSTALLINE SILICON SOLAR CELLS

Jan Schmidt [1,2)], Dennis Bredemeier[1)], Dominic C. Walter[1)]

[1)] Department of Photovoltaics, Institute for Solar Energy Research Hamelin (ISFH), [2)] Leibniz University Hanover

11:00 - 11:15 1ThO1.3

EFFECTS OF CARBON CONCENTRATION ON OXYGEN PRECIPITATION THROUGH ANNEALING PROCESS IN N-TYPE CZ-SILICON EVALUATED BY IR LIGHT SCATTERING TOMOGRAPHY

Kosuke Kinoshita [1)], Takuto Kojima[1)], Yoshio Ohshita[2)], Atsushi Ogura[1)]

[1)] Meiji University, [2)] Toyota Technological Institute

11:15 - 11:30 1ThO1.4

FAST OPTICAL DETERMINATION OF MICROVOID SIZE IN HYDROGENATED AMORPHOUS SILICON LAYERS BASED ON DATA OBTAINED FROM POSITRON ANNIHILATION SPECTROSCOPY

Nobuyuki Matsuki [1)], Nagayasu Oshima[2)], Brian E. O'Rourke[2)], Akira Uedono[3)]

[1)] Kanagawa University, [2)] National Institute of Advanced Industrial Science and Technology, [3)] University of Tsukuba

11:30 - 11:45 1ThO1.5

EVALUATION OF EFFECTIVE DIFFUSIVITIES AND THREE-DIMENSIONAL SIMULATION OF CARRIER DISTRIBUTION IN PHOSPHORUS-IMPLANTED EMITTER OF SI SOLAR CELL USING SCANNING NONLINEAR DIELECTRIC MICROSCOPY

Yasuo cho [1)], Kotaro Hirose[1)], Katsuto Tanahashi[2)], Hidetaka Takato[2)]

[1)] Research Institute of Electrical Communication, Tohoku University, [2)] National Institute of Advanced Industrial Science and Technology

11:45 - 12:00 1ThO1.6

XSOLAR-HETERO: CURRENT STATUS OF THE WEB-BASED SOLAR CELL SIMULATION PLATFORM DEVELOPED AT SERIS

Rolf Stangl [1)], Gautam Anand[1)], Rahul Jaiswal[1)], Mengjie Li[1,2)], Andreas Fell[3)], Cangming Ke[1)], Armin Aberle[1,2)]

[1)] Solar Energy Research Institute of Singapore (SERIS), [2)] Department of Electrical and Computer Engineering (ECE), National University of Singapore (NUS), [3)] Fraunhofer Institute for Solar Energy Systems

Thursday, November 16
10:30 - 12:00 Room 3 Area4

4ThO3 Organic and Dye-Sensitized Solar Cells 3

Chairpersons:
Masashi Ikegami *(Toin University of Yokohama)*
James RYAN *(National Institute for Materials Science (NIMS))*

10:30 - 10:45 4ThO3.1

EFFECTS OF IMPURITY DOPING AT PPM LEVEL IN PHOTOVOLTAIC ORGANIC OSEMICONDUCTORS

Masahiro Hiramoto [1)]

[1)] Department of Materials Molecular Science, Institute for Molecular Science (IMS)

10:45 - 11:00 4ThO3.2

HOLE RELAXATION IN POLYMER:FULLERENE SOLAR CELLS EXAMINED BY MICROWAVE SPECTROSCOPY OF A DEVICE

Akinori Saeki [1,2)]

[1)] Department of Appplied Chemistry, Osaka University, [2)] PRESTO, JST

11:00 - 11:15 4ThO3.3

FABRICATION AND PERFORMANCE OF ORGANIC SOLAR CELLS USING MoO3 / Mg AS CATHODE INTERLAYERS

Hiroshi Kageyama [1)], Iwamichi Ishikawa[1)], Akira Higa[1)]

[1)] Faculty of Engineering, University of the Ryukyus

11:15 - 11:30 4ThO3.4

CHANGE IN OUTPUT POWER OF ORGANIC PHOTOVOLTAIC MODULES CONNECTED TO ELECTRIC POWER GRID FOR 2 YEARS

Ritsuko Sato [1)], Yasuo Chiba[1)], Masayuki Chikamatsu[1)], Yuji Yoshida[1)], Atsushi Masuda[1)]

[1)] Research Center for Photovoltaics, National Institute of Adbanced Industrial Science and Technology

11:30 - 11:45 4ThO3.5

PREFERRED ORIENTATION OF C8-BTBT MOLECULES ON INORGANIC SINGLE CRYSTAL SUBSTRATES WITH VARIOUS ORIENTATION

Aye Myint Moh [1)], Khoo Pei Loon[1)], Kimihiro Sasaki[1)], Seiji Watase[2)], Tsutomu Shinagawa[1,2)], Masanobu Izaki[1)]

[1)] Mechanical Engineering Department, Toyohashi University of Technology, [2)] Osaka Municipal Technical Research Institute

11:45 - 12:00 4ThO3.6

STUDY OF DYE-SENSITIZED SOLAR CELLS PERFORMANCE

UNDER LOW LIGHT INTENSITIES AND INDOOR-LIGHT CONDITIONS

Anna B. Nikolskaia [1)], Marina F. Vildanova[1)], Olga V. Alexeeva[1)], Oleg I. Shevaleevskiy[1)], Sergey S. Kozlov[1)]

[1)] Institute of Biochemical Physics, Russian Academy of Sciences

Thursday, November 16
10:30 - 12:00 Room 5 **Area6**

6ThO5 Intermediate Band and Hot Carrier Solar Cells

Chairpersons:
Yasuhiko Takeda *(Toyota Central Research and Development Laboratories, Inc.)*
Ned Ekins-Daukes *(University of New South Wales)*

10:30 - 10:45 6ThO5.1

EFFICIENT TWO-STEP PHOTOCURRENT IN INTERMEDIATE BAND SOLAR CELLS USING HIGHLY HOMOGENEOUS INAS/GAAS QUANTUM-DOT SUPERLATTICE

Kazuki Hirao [1)], Shigeo Asahi[1)], Toshiyuki Kaizu[1)], Yukihiro Harada[1)], Takashi Kita[1)]

[1)] Department of Technology, Kobe University

10:45 - 11:00 6ThO5.2

FULL SPECTRUM QUANTUM EFFICIENCY MAPPING ON TYPE-II QUANTUM NANOSTRUCTURE SOLAR CELLS

Ryo Tamaki [1)], Yasushi Shoji[1)], Yoshitaka Okada[1)]

[1)] Research Center for Advanced Science and Technology (RCAST), The University of Tokyo

11:00 - 11:15 6ThO5.3

TWO-STEP PHOTON UP-CONVERSION SOLAR CELLS INCORPORATING A VOLTAGE BOOSTER HETERO-INTERFACE

Shigeo Asahi [1)], Kazuki Kusaki[1)], Yukihiro Harada[1)], Takashi Kita[1)]

[1)] Department of Electrical and Electronic Engineering, Kobe University

11:15 - 11:30 6ThO5.4

INFRARED ABSORPTION CHARACTERISTICS IN TWO-STEP PHOTON UP- CONVERSION SOLAR CELLS

Kazuki Kusaki [1)], Shigeo Asahi[1)], Toshiyuki Kaizu[1)], Ryo Tamaki[2)], Yoshitaka Okada[2)], Takashi Kita[1)]

[1)] Graduate School of Engineering, Kobe University, [2)] Research Center for Advanced and Technology (RCAST), The University of Tokyo, Tokyo

11:30 - 11:45 6ThO5.5

In(Ga)As / Al0.2GaAs QUANTUM DOT INTERMEDIATE-BAND-ASSISTED HOT-CARRIER SOLAR CELL WITH FABRY-PEROT CAVITY

Benoît Behaghel [1,2,3,4)], Pierre Rale[1)], Hung-Ling Chen[1)], Laurent Lombez[2)], Yasushi Shoji[3)], Ryo Tamaki[3)], Stéphane Collin[1)], Yoshitaka Okada[3,4)], Jean-François Guillemoles[2,4)]

[1)] Centre de Nanosciences et de Nanotechnologies (C2N-CNRS), Paris-Saclay University, [2)] Institute for Research and Development on Photovoltaic Energy (IRDEP-CNRS), [3)] Research Center for Advanced Science and Technology (RCAST), The University of Tokyo, [4)] NextPV, RCAST-CNRS joint lab

11:45 - 12:00 6ThO5.6

HOT CARRIER COOLING IN BULK CESIUM LEAD HALIDE PEROVSKITE AND THE QUANTUM DOTS

Qing Shen [1,5)], Teresa Ripolles[2)], Feng Liu[1)], Yaohong Zhang[1)], Naoki Nakazawa[1)], Yuhei Ogomi[2,5)], Taro Toyoda[1,5)], Kenji Yoshino[3,5)], Takashi Minemoto[4,5)], Shuzi Hayase[2,5)]

[1)] The University of Electro-Communications, [2)] Kyushu Institute of Technology, [3)] Miyazaki University, [4)] Ritsumeikan University, [5)] CREST, Japan Science and Technology Agency (JST)

Thursday, November 16
13:30 - 15:30 Room 1+2 **Area1**

1ThO2 Cell Technology 3 (Heterojunction)

Chairpersons:
Michio Kondo *(AIST)*
Philip Pieters *(imec)*

13:30 - 13:45 1ThO2.1

TOWARDS INDUSTRIALIZATION OF HETEROJUNCTION WITH THIN AND ULTRA- THIN WAFERS

Samuel HARRISON [1)], Adrien Danel[1)], Julien Gaume[1)], Maryline Joanny[1)], Charles Roux[1)]

[1)] Department of Solar Energy, CEA-LITEN

13:45 - 14:00 1ThO2.2

INFLUENCE OF THE THICKNESSES OF THE AMORPHOUS SILICON LAYERS ON THE EFFICIENCY OF SILICON HETEROJUNCTION SOLAR CELLS FOR VARIOUS CLIMATES

Jean Cattin [1)], Jan Haschke[1)], Olivier Dupré[1)], Raphaël Monnard[1)], Laurie-Lou Senaud[2)], Matthieu Despeisse[2)], Loris Barraud[2)], Mathieu Boccard[1)], Christophe Ballif[1,2)]

[1)] Institute of Microengineering, Photovoltaics and Thin-Film Electronics Laboratory, École Polytechnique Fédérale de Lausanne (EPFL), [2)] Swiss Center for Electronics and Microtechnology (CSEM), PV-center

14:00 - 14:15 1ThO2.3

"FLASH" FIRED HOLE SELECTIVE SILICON-BASED HETEROJUNCTION CONTACTS

Andrea Ingenito [1)], Gizem Nogay[1)], Christophe Allebé[2)],

Jrg Horzel[2)], Matthieu Despeisse[2)], Franz-Josef Haug[1)], Philipp Friedrich Hermann Löper[1)], Christophe Ballif[1,2)]

[1)] Photovoltaics and Thin-Film Electronics Laboratory, École Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT), [2)] CSEM, PV-Centre

14:15 - 14:30 1ThO2.4

PECVD LAYERS FOR HIGH AND LOW TEMPERATURE IMPROVED INDUSTRIAL SOLAR CELL PROCESSES

Christophe Allebé [1)], Antoine Descoeudres[1)], Jorg Horzel[1)], Andrea Ingenito[2)], Gizem Nogay[2)], Philippe Wyss[2)], Josua Stuckelberger[2)], Franz-Josef Haug[2)], Matthieu Despeisse[1)], Christophe Ballif[1,2)]

[1)] CSEM SA, PV-Center, [2)] École Polytechnique Fédérale de Lausanne (EPFL), Institute of Microengineering (IMT), Photovoltaics and Thin-Film Electronics Laboratory

14:30 - 14:45 1ThO2.5

REAR-EMITTER SILICON HETEROJUNCTION SOLAR CELLS: ADVANCED FRONT-CONTACT MATERIALS FOR HIGH-EFFICIENY INDUSTRIAL CELLS

Bernd Stannowski [1)], Anna Belen Morales Vilches[1)], Luana Mazzarella[1)], Sebastian Neubert[1)], Alexandros Cruz-Bournazou[1)], Matteo Werth[1)], Daniel Meza[2)], Max Sebastian Hendrichs[1)], Lars Korte[2)], Rutger Schlatmann[1)]

[1)] Helmholtz-Zentrum Berlin, PVcomB [2)] Helmholtz-Zentrum Berlin, Inst. for Silicon Photovoltaics

14:45 - 15:00 1ThO2.6

IMPACT OF WAFER THICKNESS ON A-SI:H/C-SI HETEROJUNCTION SOLAR CELLS

Hitoshi Sai [1,2)], Hiroshi Umishio[1,3)], Takuya Matsui[1,2)], Shota Nunomura[1,2)], Tomoyuki Kawatsu[4)], Hidetaka Takato[2)], Koji Matsubara[1,2)]

[1)] Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST), [2)] Renewable Energy Research Center, Fukushima Renewable Energy Research Intitute (FREA), [3)] Tsukuba University, [4)] Komatsu NTC Ltd.

15:00 - 15:15 1ThO2.7

>23% SILICON HETEROJUNCTION SOLAR CELLS IN MEYER BURGER'S DEMO LINE: RESULTS OF PILOT PRODUCTION ON MASS PRODUCTION TOOLS

Jun Zhao [1)], Marcel König[1)], Yu Yao[2)], Thomas Söderström[2)]

[1)] Meyer Burger (Germany) AG, [2)] Meyer Burger AG

15:15 - 15:30 1ThO2.8

FABRICATION OF SILICON HETEROJUNCTION SOLAR CELLS WITH BARIUM DISILICIDE THIN FILMS PREPARATED BY THERMAL EVAPORATION

Kazuma Takahashi [1)], Yoshihiko Nakagawa[1)], Kazuhiro Goto[1)], Kosuke O. Hara[2)], Isao Takahashi[1)], Yasuyoshi Kurokawa[1)], Noritaka Usami[1)]

[1)] Graduate school of Engineering, Nagoya University, [2)] University of Yamanashi

Thursday, November 16
13:30 - 15:30 Room 3 **Area2**

2ThO4 CIGS Devices I

Chairpersons:
Hitoshi Tampo *(National Institute of Advanced Industrial Science and Technology)*
Michael Powalla *(ZSW (Centre for Solar Energy and Hydrogen Research))*

13:30 - 14:00 2ThO4.1

[Invited]

DEVELOPMENTS IN ALKALI TREATED CIGS SOLAR CELLS: FLEXIBLE AND TANDEM DEVICES WITH PEROVSKITE

Ayodhya N. Tiwari [1)], Enrico Avancini[1)], Lucas Zortea[1)], Fan Fu[1)], Stefano Pisoni[1)], Thomas Feurer[1)], Shiro Nishiwaki[1)], Thomas Paul Weiss[1)], Romain Carron[1)], Lukas Greuter[1)], Stephan Buecheler[1)]

[1)] Laboratory for Thin Films and Photovoltaics, Empa-Swiss Federal Laboratories for Materials Science and Technology

14:00 - 14:15 2ThO4.2

IMPACTS OF LONG-TERM HEAT-LIGHT SOAKING ON CIGS SOLAR CELLS WITH KF POST-DEPOSTION TREATMENT

Jiro Nishinaga [1)], Takashi Koida[1)], Shogo Ishizuka[1)], Yukiko Kamikawa[1)], Hajime Shibata[1)], Shigeru Niki[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology (AIST)

14:15 - 14:30 2ThO4.3

INVESTIGACION ON ALKALI-TREATMENT MECHANISMS FOR IMPROVING ENERGY CONVERSION EFFICIENCY OF Cu(In,Ga)(Se,S)2 MODULES

Jyh-Lih Wu [1)], Kong Fai Tai[1)], Yasuaki Iwata[1)], Takuya Kato[1)], Hiroki Sugimoto[1)], Veronica Bermudez[1)]

[1)] Atsugi Research Center, Solar Frontier K.K., Japan

14:30 - 14:45 2ThO4.4

EFFECTS OF RUBIDIUM FLUORIDE POST DEPOSITION TREATMENTS ON QUATERNARY CIGS AND TERNARY CGS THIN FILM SOLAR CELLS

Shogo Ishizuka [1)], Noboru Taguchi[2)], Jiro Nishinaga[1)], Yukiko Kamikawa[1)], Shingo Tanaka[2)], Hajime Shibata[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, [2)] Research Institute of Electrochemical Energy, National Institute of Advanced Industrial Science and Technology

14:45 - 15:00 2ThO4.5

INVESTIGATING THE PROPERTIES OF RbF-TREATED CIGS THIN-FILMS AND RESULTING DEVICES

Tim Kodalle [1)], Marc D. Heinemann[1)], Hasan A. Yetkin[1,2)], Setareh Zahedi-Azad[3)], Iver Lauermann[1)], Rutger Schlatmann[1,4)], Christian A. Kaufmann[1)]

[1)] PVcomB/Helmholtz-Zentrum Berlin für Materialien und Energie, Germany, [2)] Technical University Berlin, Germany, [3)] Martin-Luther-University Halle-Wittenberg, Germany, [4)] Hochschule für Technik und Wirtschaft Berlin, Germany

15:00 - 15:15 2ThO4.6

COMPARATIVE STUDY OF HEAT LIGHT SOAKING ON MF (M= K, Cs) TREATED CIGS SOLAR CELLS WITH CDS BUFFER LAYER

Ishwor Khatri [1)], Kosuke Shudo[2)], Junpei Matsuura[2)], Mutsumi Sugiyama[1,2)], Tokio Nakada[1)]

[1)] Research Institute for Science and Technology Tokyo University of Science, [2)] Faculty of Science and Technology, Tokyo University of Science

15:15 - 15:30 2ThO4.7

EXPERIMENTAL INVESTIGATION OF Cd- AND Zn-DIFFUSION EFFECT FOR Cu(In,Ga)Se2 SOLAR CELLS WITH Cu-POOR LAYER

Hiroki Sugiura [1)], Takahito Nishimura[2)], Kazuyoshi Nakada[1)], Akira Yamada[1)]

[1)] Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, [2)] Department of Physical Electronics, Tokyo Institute of Technology

Thursday, November 16
13:30 - 15:30 Room 5 Area6

6ThO6 Quantum Dot Solar Cells and Emerging Technologies

Chairpersons:
Yoshitaka Okada *(University of Tokyo)*
Qing Shen *(The University of Electro-Communications)*

13:30 - 14:00 6ThO6.1

[Invited]

THE ROLE OF RATCHETS IN PHOTOVOLTAICS

Ned Ekins-Daukes [1)], C. Phillips[2)], A. Pusch[2)], A. Vaquero[2)], M. Yoshida[2)], T. Schmidt[1)]

[1)] University of New South Wales, [2)] Imperial College London

14:00 - 14:15 6ThO6.2

Optimizing the Front Contacts of PbSe Quantum Dot Solar Cell with Additional Au Grids

Zihan Chen [1)], Zhilong Zhang[1)], Robert Patterson[1)], Gavin Conibeer[1)], Shujuan Huang[1)]

[1)] School of Photovoltaic and Renewable Energy Engineering, University of New South Wales

14:15 - 14:30 6ThO6.3

PASSIVATING LEAD SELENIDE QUANTUM DOT THIN FILM SOLAR CELLS WITH INORGANIC PEROVSKITE NANOPARTICLES

Zhilong Zhang [1)], Zihan Chen[1)], Lin Yuan[1)], Gavin Conibeer[1)], Robert Patterson[1)], Shujuan Huang[1)]

[1)] Australian Centre for Advanced Photovoltaics, University of New South Wales

14:30 - 14:45 6ThO6.4

SURFACE AND ENERGY BAND ENGINEERING OF ENVIROMENTALLY FRIENDLY QUANTUM DOTS FOR MULTIPLE EXCITONS SOLAR CELLS

Vladimir Švrček [1)], Mickael Lozac'h[1)], Marius Buerkle[1)], Atta Ul Haq[2)], Calum McDonald[2)], Davide Mariotti[2)], Koji Matsubara[1)]

[1)] National Institute of Advanced Industrial Science and Technology, [2)] Nanotechnology and Advanced Materials Research Institute (NAMRI),Ulster University

14:45 - 15:00 6ThO6.5

ENHANCEMENT ON PHOTOVOLTAIC PROPERTIES OF HEAVILY PHOSPHORUS-DOPED SUPER-HIGH DENSITY SI QUANTUM DOT THIN FILM BY S PIN-ON METHOD

Pin-Ruei Huang [1)], Sung-Che Lin[1)], Po-Tsung Lee[1)]

[1)] Department of Photonics, National Chiao Tung University

15:00 - 15:15 6ThO6.6

LOOKING AT THE TUNNEL RECOMBINATION JUNCTIONS OF AN A-SI:H/NC- SI:H/SHJ SOLAR CELL FOR WATER SPLITTING APPLICATIONS

Paula Perez-Rodriguez [1)], Machiel Stam[1)], Michael Falkenberg[1)], Ravi Vasudevan[2)], Miro Zeman[1)], Arno H.M. Smets[1)]

[1)] Photovoltaic Materials and Devices (PVMD) group, Delft University of Technology, [2)] INES

15:15 - 15:30 6ThO6.7

NONEQUILIBRIUM THEORY ON THE CONVERSION EFFICIENCY LIMIT OF SOLAR CELLS INCLUDING FINITE THERMALIZATION AND EXTRACTION TIME

Kenji Kamide [1)], Toshimitsu Mochizuki[1)], Hidefumi Akiyama[2,3)], Hidetaka Takato[1)]

[1)] AIST, [2)] ISSP, Univ. Tokyo, [3)] AIST OPERANDO-OIL

Friday, November 17
8:30 - 10:00 Room 1+2 **Area1**

1FrO1 Thin Film Technologies

Chairpersons:
Arno H. M. Smets *(Delft University of Technology)*
Akira Terakawa *(Panasonic Corporation, Eco-Solutions Company)*

8:30 - 9:00 **1FrO1.1**

[Invited]

WYSIPS® CRYSTAL TECHNOLOGY: AN INVISIBLE ENERGY HARVESTING SOLUTION FOR LOW POWER OLED DISPLAYS

Barthold Veenendaal [1)], Badre Kerzabi[1)]

[1)] Sunpartner Technologies, France

9:00 - 9:15 **1FrO1.2**

Silicon-based Multi-junction Solar Cells

Xiaodan Zhang [1,2,3,4)], Bofei Liu[1,2,3,4)], Lisha Bai[1,2,3,4)], Yi Ding[1,2)], Ying Zhao[1,2,3,4)], Jia Fang[1,2,3,4)], Tiantian Li[1,2,3,4)], Xin Yao[1,2,3,4)], Shijie Zhu[1,2,3,4)], Qianshang Ren[1,2,3,4)], Changchun Wei[1,2)], Qian Huang[1,2)], Jian Ni[1,2)], Dekun Zhang[1,2)], Xinliang Chen[1,2)], Shengzhi Xu[1,2)], Huizhi Ren[1,2)], Guangcai Wang[1,2)], Yuelong Li[1,2,3,4)], Baozhang Li[1,2)]

[1)] Institute of Photoelectronic Thin Film Devices and Technology of Nankai University, Nankai University, [2)] Key Laboratory of Photoelectronic Thin Film Devices and Technology of Tianjin, [3)] Key Laboratory of Photoelectronic Thin Film Devices and Technology of Ministry of Education, [4)] Collaborative Innovation Center of Chemical Science and Engineering (Tianjin)

9:15 - 9:30 **1FrO1.3**

MINI-MODULES BASED ON THIN LIQUID-PHASE CRYSTALLIZED SILICON ON GLASS

Sven Kühnapfel[1)], Tim Frijnts[2)], Holger Rhein[2)], Stefan Gall [1)], Rutger Schlatmann[2)], Bernd Rech[1)]

[1)] Helmholtz-Zentrum Berlin für Materialien und Energie, Institut für Silizium-Photovoltaik, [2)] Helmholtz-Zentrum Berlin für Materialien und Energie, PVcomB

9:30 - 9:45 **1FrO1.4**

HYDROGEN PLASMA ETCHING OF RCA CHEMICAL OXIDE AND ITS USE IN HETEROJUNCTION SOLAR CELL APPLICATIONS

JIA GE [1)], JIN LIU[1)], BOON HENG TEO[1)], DELIO PEREZ[1)], EDWIN CARMONA[1)], MARYKNOL DELOS SANTOS[1)], THOMAS MUELLER[1)]

[1)] Solar Energy Research Institute of Singapore

9:45 - 10:00 **1FrO1.5**

INFLUENCE OF DC POWER ON THE PROPERTIES OF i-a-Si:H PASSIVATION LAYER DEPOSITED BY FACING TARGET SPUTTERING

Yuta Shiratori [1)], Faris Akira[1)], Kazuyoshi Nakada[1)], Shinsuke Miyajima[1)]

[1)] Tokyo Institute of Technology

Friday, November 17
8:30 - 10:00 Room 3 **Area2**

2FrO3 Materials Characterization

Chairpersons:
Jiro Nishinaga *(AIST)*
Harvey Guthrey *(National Renewable Energy Laboratory (NREL))*

8:30 - 8:45 **2FrO3.1**

ELECTRONIC DEFECTS IN CIGSe: A COMPREHENSIVE MODEL

Susanne Siebentritt [1)], Conrad Spindler[1)], Finn Babbe[1)]

[1)] Laboratory for Photovoltaics, University of Luxembourg

8:45 - 9:00 **2FrO3.2**

IMPACT OF KF-POST DEPOSITION TREATMENT ON SURFACE ELECTRONIC STRUCTURE OF CIGSSe AND CIGSe ABSORBERS

Suehiro Kawamura[1)], Yuya Iwamoto[1)], Kohei Tanigawa[1)], Takuya Kato[2)], Hiroki Sugimoto[2)], Shogo Ishizuka[3)], Hajime Shibata[3)], Koji Matsubara[3)], Shigeru Niki[3)], Norio Terada [1)]

[1)] Graduate School of Science and Engineering, Kagoshima University, [2)] Solar Frontier K. K., [3)] AIST

9:00 - 9:15 **2FrO3.3**

DEEP LEVEL EMISSION IN POLYCRYSTALLINE CUGASE2 THIN-FILMS OBSERVED BY MICRO-PHOTOLUMINESCENCE

Muhammad Monirul Islam [1)], Shenghao Wang[1)], Shogo Ishizuka[2)], Hajime Shibata[2)], Shigeru Niki[2)], Katsuhiro Akimoto[1)], Takeaki Sakurai[1)]

[1)] University of Tsukuba, [2)] National Institute of Advanced Industrial Science and Technology (AIST)

9:15 - 9:30 **2FrO3.4**

FIRST PRINCIPLES STUDIES ON EFFECTS OF LIGHT AND HEAVY ALKALI ELEMENTS IN Cu(In,Ga)Se2 SOLAR CELLS

Tsuyoshi Maeda [1)], Takahiro Wada[1)]

[1)] Department of Materials Chemistry, Ryukoku University

9:30 - 9:45 **2FrO3.5**

BAND OFFSET AT THE INTERFACE BETWEEN CDS BUFFER AND CZTGSE ABSORBER LAYER

Takehiko Nagai [1)], Kenta Kawasaki[2)], Suehiro Kawamura[2)],

Shin'ichi Takaki[2)], Takuya Shimamura[2)], Hitoshi Tampo[1)], Shinho Kim[1)], Hajime Shibata[1)], Shigeru Niki[1)], Norio Terada[2)]

[1)] Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Scienece and Technology (AIST), [2)] Kagoshima University

9:45 - 10:00 2FrO3.6

OPTICAL PROPERTIES OF Cu2ZnGeSe4 WITH VERY LOW URBACH ENERGY: COMPARISON WITH Cu-Se-BASED MATERIALS

Shohei Fujimoto [1)], Hitoshi Tampo[2)], Shinho Kim[2)], Keisuke Nagaya[1)], Mitsutoshi Nishiwaki[1)], Kang Min Kim[2)], Hajime Shibata[2)], Shigeru Niki[2)], Hiroyuki Fujiwara[1)]

[1)] Department of Electrical, Electronic and Computer Engineering, Gifu University, [2)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

Friday, November 17
8:30 - 10:00 Room 5 Area10

10FrO5 PV Deployment and Sustainability

Chairpersons:
Hiroyuki Yamada *(New Energy and Industrial Technology Development Organization)*
Andrea Wade *(Deputy Operating Agent IEA PVPS Task12)*

8:30 - 9:00 10FrO5.1

[Invited]

CHANCES AND CALLENGES FOR PHOTOVOLTAICS IN EUROPE AFTER THE FEED-IN-TARIF SCHEMES

Arnulf Jaeger-Waldau [1)], Thomas Huld[1)], Sandor Szabo[1)]

[1)] European Commission, JRC, Energy Efficiency and Renewables Unit

9:00 - 9:15 10FrO5.2

Innovative Framework Model for Post-Subsidy PV Market Forecast

Gaëtan Masson [1)], Chris Werner[2)], Philippe Macé[1)], Alexander Gerlach[3)]

[1)] Becquerel Institute, [2)] Chris Werner Energy Consulting, [3)] Gerlach New Energy Consulting

9:15 - 9:30 10FrO5.3

CHINA'S PV MARKET TILL 2020 - VIETNAM AN EMERGING UP AND DOWNSTREAM SOLAR PV MARKET

Frank Haugwitz [1)]

[1)] Asia Europe Clean Energy (Solar) Advisory Co. Ltd.

9:30 - 9:45 10FrO5.4

PROSPECTS OF PV DEPLOYMENT IN JAPAN TOWARDS 2030

Koichi SUGIBUCHI [1)], Risa KURIHARA[1)], Haruki YAMAYA[1)], Takashi OHIGASHI[1)], Izumi KAIZUKA[1)], Osamu IKKI[1)]

[1)] RTS Corporation

9:45 - 10:00 10FrO5.5

PV RECYCLING SIMPLY WITH LIGHT: NEW, INNOVATIVE AND ECONOMIC

Wolfram J. Palitzsch [1)], Ulrich M. Loser[1)]

[1)] Loser Chemie GmbH

Friday, November 17
8:30 - 10:00 Room 6 Area7

7FrO7 Potential-Induced Degradation

Chairpersons:
Yasuaki Ishikawa *(Nara Institute of Science and Technology)*
Hung-Sen Wu *(Industrial Technology Research Institute)*

8:30 - 8:45 7FrO7.1

J_{SC} AND V_{OC} REDUCTIONS IN SILICON HETEROJUNCTION PHOTOVOLTAIC MODULES BY POTENTIAL-INDUCED DEGRADATION TESTS

Keisuke Ohdaira [1)], Seira Yamaguchi[1)], Chizuko Yamamoto[2)], Atsushi Masuda[2)]

[1)] Graduate School of Advanced Science and Technology, Japan Advanced Institute of Science and Technology, [2)] National Institute of Advanced Industrial Science and Technology

8:45 - 9:00 7FrO7.2

SODIUM DISTRIBUTIONS AT THE SURFACE OF SILICON NITRIDE FILM AFTER POTENTIAL INDUCED DEGRADATION TEST AND RECOVERY TEST OF PV MODULES

Fumitaka Ohashi [1)], Yoshiki Mizuno[1)], Hiroki Yoshida[1)], Hiroya Kosuga[1)], Taishi Furuya[1)], Ruben Jerónimo Freitas[1)], Yukiko Hara[2)], Atsushi Masuda[2)], Shuichi Nonomura[1)]

[1)] Faculty of Engineering, Gifu University, [2)] National Institute of Advanced Industrial Science and Technology

9:00 - 9:15 7FrO7.3

INFLUENCE OF BIAS APPLICATION ON POTENTIAL INDUCED DEGRADATION FOR CRYSTALLINE SILICON PHOTOVOLTAIC MODULES

Sachiko Jonai [1)], Tadanori Tanahashi[1)], Hajime Shibata[1)], Atsushi Masuda[1)]

[1)] Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST)

9:15 - 9:30 7FrO7.4

ESTIMATING THE PERFORMANCE OF PID-INFLUENCED PV MODULES FROM QUANTITATIVE ELECTROLUMINESCENCE

MEASUREMENTS

Karl G. Bedrich [1)], Wei Luo[1)], Yifeng Chen[2)], Pierre J. Verlinden[2)], Sarah Kurtz[3)], Peter Hacke[3)], Zhiqiang Feng[2)], Yan Wang[1)], Armin G. Aberle[1)], Yong Sheng Khoo[1)]

[1)] SERIS, NUS, Singapore, [2)] TRINA Solar, China, [3)] NREL, USA

9:30 - 9:45 7FrO7.5

Carrier Dynamics in the Potentially Induce Degraded Photovoltaic Modules

Mohammad Aminul Islam [1)], Hiroyuki Matsuzaki[2)], Hidenari Nakahama[3)], Yasuaki Ishikawa[1)]

[1)] Graduate School of Material Science, Nara Institute of Science and Technology, [2)] National Institute of Advanced Industrial Science and Technology, [3)] Nisshinbo Mechatronics Inc.

9:45 - 10:00 7FrO7.6

EFFECTS OF LIGHT IRRADIATION DURING POTENTIAL-INDUCED DEGRADATION TESTS FOR P-TYPE CRYSTALLINE SILICON PHOTOVOLTAIC MODULES

Yukiko Hara[1)], Atsushi Masuda [1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

Friday, November 17
10:30 - 12:00 Room 1+2 Area1

1FrO2 Carrier Selective Contact

Chairpersons:
Tomihisa Tachibana *(AIST)*
Hyunju Lee *(Toyota Technological Institute)*

10:30 - 10:45 1FrO2.1

ANALYSIS OF WORKFUNCTION OF MOOX AT MOOX/SIO2 INTERFACE BY CAPACITANCE-VOLTAGE MEASUREMENT

Takefumi Kamioka [1)], Yutaka Hayashi[1)], Yuki Isogai[1)], Kyotaro Nakamura[2)], Yoshio Ohshita[1)]

[1)] Toyota Technological Institute, [2)] Meiji University

10:45 - 11:00 1FrO2.2

TUNABLE ELECTRON AND HOLE SELECTIVITY OF TITANIUM OXIDE BASED CONTACTS FOR CRYSTALLINE SILICON SOLAR CELLS

Takuya Matsui [1,2)], Martin Bivour[1)], Paul Ndione[1,3)], Paul Hettich[1)], Martin Hermle[1)]

[1)] Fraunhofer ISE, [2)] AIST, [3)] NREL

11:00 - 11:15 1FrO2.3

POLY-SI(O)X PASSIVATING CONTACTS FOR MINIMIZING PARASITIC ABSORPTION IN IBC C-SI CELLS

Guangtao Yang [1)], Paul Procel[1)], Yue Zhang[1)], Arthur Weeber[1)], Olindo Isabella[1)], Miro Zeman[1)]

[1)] Photovoltaic Materials and Devices group, Delft University of Technology

11:15 - 11:30 1FrO2.4

PASSIVATING CONTACTS BASED ON LAYERS OF SILICON-OXIDE AND CARBIDE FOR CRYSTALLINE SILICON SOLAR CELLS

Franz-Josef Haug [1)], Philippe Wyss[1)], Gizem Nogay[1)], Josua Stückelberger[1)], Andrea Ingenito[1)], Iris Mack[1)], Christophe Allebé[2)], Jrg Horzel[2)], Philipp Löper[1)], Christophe Ballif[1,2)]

[1)] PV-Lab, Ecole Polytechnique Fdrale de Lausanne, [2)] CSEM, PV-Center

11:30 - 11:45 1FrO2.5

INDUSTRIALLY FEASIBLE, DOPANT-FREE, CARRIER-SELECTIVE PASSIVATING CONTACTS FOR HIGH-EFFICIENCY CRYSTALLINE SILICON SOLAR CELLS

Xinbo Yang [1,2)], Klaus Weber[1)], Stefaan De Wolf[2)]

[1)] Research School of Engineering, Australian National University, [2)] King Abdullah University of Science and Technology (KAUST)

11:45 - 12:00 1FrO2.6

EMBEDDED METAL ELECTRODE FOR HIGH-EFFICIENCY PEDOT:PSS/SI NANOWIRE HYBRID SOLAR CELLS

Deokjae Choi [1)], Han-Don Um[1)], Inchan Hwang[1)], Namwoo Kim[1)], Kangmin Lee[1)], Ji Hoon Seo[1)], Jeonghwan Park[1)], Kwanyong Seo[1)]

[1)] Department of Energy Engineering, Ulsan National Institute of Science and Technology (UNIST)

Friday, November 17
10:30 - 12:00 Room 3 Area2

2FrO4 CIGS Devices Ⅱ

Chairpersons:
Takeaki Sakurai *(University of Tsukuba)*
Ayodhya N. Tiwari *(Empa-Swiss Federal Laboratories for Materials Science and Technology)*

10:30 - 10:45 2FrO4.1

[Area Leading invited]

DEVICE STRUCTURE AND PROCESS CONTROL FOR CIGS SOLAR CELLS ON FLEXIBLE SUBSTRATE

Jae Ho Yun [1)], Kihwan Kim[1)], Seung Kyu Ahn[1)], Young-Joo Eo[1)], Jihye Gwak[1)], Jun-Sik Cho[1)], Ara Cho[1)]

[1)] Photovoltaic Laboratory, Korea Institute of Energy Research, Korea

10:45 - 11:00 2FrO4.2

AMORPHOUS IN2O3-BASED FRONT CONTACT LAYERS FOR CU(IN,GA)SE2 SOLAR CELLS

Takashi Koida [1)], Yuko Ueno[1)], Jiro Nishinaga[1)], Hirohumi Higuchi[1)], Hideki Takahashi[1)], Masayuki Iioka[1)], Hajime Shibata[1)], Shigeru Niki[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

11:00 - 11:15 2FrO4.3

DOPING MANIPULATED AZO AS FRONT TCO BY USING SERIAL CO-SPUTTERING FOR CIGS SOLAR CELLS

Stefan Körner [1)], Rulsan Muydinov[1)], Darja Erfurt[2)], Manuel Hartig[1)], Bernd Szyszka[1,3)], Reiner Klenk[2)]

[1)] Technical University, Germany, [2)] PVcomB - Helmholtz-Zentrum Berlin für Materialien und Energie, Germany, [3)] Fraunhofer IST, Germany

11:15 - 11:30 2FrO4.4

EFFECTS OF SUBSTRATE TEMPERATURE ON CONTROLLING INTERFACIAL QUALITY OF Cu(In,Ga)Se2 SOLAR CELLS BY Se ANNEALING

Akihide Kaneko [1)], Adiyudha Sadono[1)], Kazuyoshi Nakada[1)], Akira Yamada[1)]

[1)] Department of Physical Electronics, Tokyo Institute of Technology

11:30 - 11:45 2FrO4.5

OPTICAL AND RECOMBINATION LOSSES IN CIGSe, CZTSSe AND CdTe SOLAR CELLS DETERMINED BY GLOBAL EQE ANALYSIS METHOD

Hiroyuki Fujiwara [1)], Akihiro Nakane[1)], Hitoshi Tampo[2)], Shohei Fujimoto[1)], Kang Min Kim[2)], Shinho Kim[2)], Hajime Shibata[2)], Shigeru Niki[2)]

[1)] Department of Electrical, Electronic and Computer Engineering, Gifu University, [2)] AIST

11:45 - 12:00 2FrO4.6

QUASI FERMI LEVEL SPLITTING OF CU-RICH AND CU-POOR CIS ABSORBER LAYERS

Alberto Lomuscio [1)], Tobias Rödel[1)], Michele Melchiorre[1)], Susanne Siebentritt[1)]

[1)] Laboratory for Photovoltaics, Physics and Materials Science Research Unit, University of Luxembourg

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Friday, November 17
10:30 - 12:00 Room 5 **Area3**

3FrO6 Concentrator PV

Chairpersons:
Frank Dimroth *(Fraunhofer ISE)*
Araki Kenji *(Toyota Technological Institute)*

10:30 - 11:00 3FrO6.1

[Invited]

LUMINESCENT SOLAR CONCENTRATOR DESIGNS

Angèle Reinders [1)], Ravi Kishore[1)], Wouter Eggink[1)]

[1)] Faculty of Engineering Technology, University of Twente

11:00 - 11:15 3FrO6.2

[Area Leading invited]

CPV and storage battery

Takashi Iwasaki [1)]

[1)] Solar Energy Department, Power Systems R&D Center, Sumitomo Elecrtric Industries, LTD.

11:15 - 11:30 3FrO6.3

CHARACTERIZATION OF III-V ON SI TANDEM SOLAR CELLS UNDER LOW CONCENTRATION USING A PULSED SOLAR SIMULATOR AND COMPONENT CELLS

Elias Veinberg-Vidal [1,2)], Laura Vauche[1,2)], Karim Medjoubi[1,2)], Clmnt Weick[1,2)], Pablo García-Linares[3)], Alejandro Datas[3)], Anne Kaminski-Cachopo[4)], Christophe Jany[1,2)], Philippe Voarino[1,2)], Ccilia Dupré[1,2)]

[1)] DCOS/SCPE/LC2E CEA, LETI, [2)] Universit Grenoble Alpes, France, [3)] IES-UPM, Spain, [4)] IMEP-LAHC, France

11:30 - 11:45 3FrO6.4

DEVELOPMENT OF DUAL AXIS MICROTRACKING SYSTEM FOR CONCENTRATOR PHOTOVOLTAIC

Masakazu Nakatani [1,2)], Noboru Yamada[2)]

[1)] Sun Marion Co., Ltd., [2)] Nagaoka University of Technology

11:45 - 12:00 3FrO6.5

SOLAR POWERED CAR BY STATIC CONCENTRATOR PHOTOVOLTAICS

Taizo Masuda [1,2)], Kenji Araki[2)], Kenichi Okumura[1)], Shinichi Urabe[1)], Yuki Kudo[1)], Takashi Nakado[1)], Akinori Sato[1)], Masafumi Yamaguchi[2)], Kazutaka Kimura[1)]

[1)] Future project division, Toyota Motor Corporation, [2)] Toyota Technological Institute

Friday, November 17
10:30 - 12:00 Room 6 **Area7**

7FrO8 Module Reliability and Characterization

Chairpersons:
Atsushi Masuda *(National Institute of Advanced Industrial Science and Technology)*
Nick S. Bosco *(National Renewable Energy Lboratory)*

10:30 - 10:45 7FrO8.1

[Area Leading invited]

NEW CHALLENGE ON MECHANICAL LOAD TEST FOR MODULE CERTIFICATION

Hung-Sen Wu [1)]

[1)] Center for Measurement Standards/ Photovoltaic Metrology Laboratory, Industrial Technology Research Institute

10:45 - 11:00 7FrO8.2

ACCELERATION TEST OF COMBINED STRESSES FOR FLEXIBLE SOLAR MODULES

Akihiro Takano [1)], Tetsuro Nakamura[1)], Tetsuya Fukuda[1)], Ayumi Hamada[1)], Hiroki Sato[1)], Masaaki Toda[1)]

[1)] F-WAVE Company Limited

11:00 - 11:15 7FrO8.3

DOES CURRENT INJECTION DURING ENVIRONMENTAL STRESS TESTING ACCELERATE THE TARGET DEGRADATION MECHANISMS?

Jiang Zhu [1)], Daniel Montiel-Chicharro[1)], Michael Owen-Bellini[1)], Karl Bedrich[1)], Thomas R. Betts[1)], Ralph Gottschalg[1)]

[1)] Centre for Renewable Energy Systems Technology, Wolfson School of Mechanical, Electrical and Manufacturing Engineering, Loughborough University

11:15 - 11:30 7FrO8.4

DETECTION OF PREMONITORY SYMPTOM IN DEFECTIVE MODULES BY DARK I-V CHARACTERISTICS WITH EL DIAGNOSIS

Takashi Fuyuki [1)], Tadashi Obayashi[2)], Kohji Masuda[2)], Yasunori Uchida[2)], Hiroshi Taniguchi[2)], Yoshiteru Nitta[2)]

[1)] Active Solar Innovation, Inc., [2)] Japan Electrical Safety & Environmental Technology Laboratories (JET)

11:30 - 11:45 7FrO8.5

IMPROVEMENT ON THE VERIFICATION METHOD OF ELECTROLUMINESCENCE IMAGING OF THE DEGRADED PV MODULE

Panom Parinya[1)], Manit Seapan [1)], Chamnan Limsakul[1)], Krissanapong Kirtikara[1)], Dhirayut Chenvidhya[1)], Tanokkorn Chenvidhya[1)], Ballang Muenpinij[1)], Yaowanee Sangpongsanon[1)]

[1)] CES Solar Cells Testing Center, King Mongkut's University of Technology Thonburi

11:45 - 12:00 7FrO8.6

OUTDOOR PHOTOLUMINESCENCE MEASUREMENTS OF PHOTOVOLTAIC MODULES UNDER FULL SUNLIGHT ILLUMINATION

Raghavi Bhoopathy [1)], Oliver Kunz[1)], Mattias Juhl[1)], Thorsten Trupke[1)], Ziv Hameiri[1)]

[1)] School of Photovoltaics and Renewable Energy Engineering, University of New South Wales, Sydney, Australia

Closing

Friday, November 17

Closing Ceremony

12:00 - 13:00 Room1+2

Chairperson:

12:00 - 12:20

Overall Conference Summary

Akira Yamada (Tokyo Institute of Technology)

12:20-12:40

Award Ceremony

Best Paper Award

Young Researcher Paper Award

Student Paper Award

12:40-13:00

Greetings from the Future Conference Representatives

WCPEC-7 (45th IEEE PVSC, 34th EU PVSEC, 28th PVSEC)

35th EU PVSEC

PVSEC-29

Program Poster

Tuesday, November 14
16:00-18:00 Room7+8+9 **Area1**

1TuPo.1

LONG-TERM DEGRADATION OF FRONT SIDE COPPER METALLIZATION OF SILICON SOLAR CELLS

Wen Jauh Chen[1)], You Ren Cheng[1)], Keisuke Ohdaira[2)], Koichi Higashimine[2)], Xiaobin Zhang[2)]

[1)] Graduate School of Materials Science, National Yunlin University of Science and Technology, [2)] Japan Advanced Institute of Science and Technology (JAIST)

1TuPo.2

INFLUENCE OF NON-BONDED HYDROGENS ON AMORPHOUS SILICON NETWORK IN HYDROGENATED AMORPHOUS SILICON

Takeyuki Sekimoto[1)], Mitsuhiro Matsumoto[2)], Akira Terakawa[2)]

[1)] Advanced Research Division, Panasonic Corporation, [2)] Eco Solutions Company, Panasonic Corporation

1TuPo.3

Control of Microstructure and Crack in Polycrystalline Silicon Ingot using Simulation Method

Jun-Kyu Lee[1)], Jin-Seok Lee[1)], Young-Soo Ahn[1)], Gi-Hwan Kang[2)]

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1TuPo.4

OUTDOOR POWER GENERATION CHARACTERISTICS OF InGaP//Si SPECTRUM SPLITTING SOLAR CELLS

Satomi Takahashi[1)], Makoto Konagai[1)]

[1)] Tokyo City University

1TuPo.5

LEAD-FREE FRONT SIDE SILVER PASTE WITH TELLURITE GLASS FOR CRYSTALLINE SILICON SOLAR CELLS (AL-BSF AND PERC)

Masayuki Kurahashi[1)], Shiho Tsukahara[1)], Kousuke Nishimura[1)], Katsuhiko Shirasawa[2)], Hidetaka Takato[2)]

[1)] Research and Development, Shoei Chemical Inc, [2)] National Institute of Advanced Industrial Science and Technology (AIST)

1TuPo.6

Low Minority Carrier Lifetime at the Bottom of Quasi-single Crystalline Silicon

Peng Ni[1,2)], Lei Wang[1)], Chunlai Huang[1,2)], Da You[2)], Chen Wang[2)], Deren Yang[1)]

[1)] State Key Laboratory of Silicon Materials Science & Eng, Zhejiang University, [2)] Jiangsu Key Lab of Silicon Based Electronic Materials, Jiangsu GCL Silicon Material Technology Development Co., Ltd.,

1TuPo.7

REUSABLE SI3N4 CRUCIBLES MADE FROM KERF-LOSS SILICON FOR MULTI- CRYSTALLINE SILICON GROWTH

Chung-Wen Lan[1)], Y. Z. Liu[1)], C. Y. Lan[1)], C.F. Yang[1)], A. Lan[1,2)], C. Hsu[2)]

[1)] Chemical Engineering, National Taiwan University, [2)] Sino-American Silicon Products Inc.

1TuPo.8 ► 1ThPo.35

1TuPo.9

SI-BASED TANDEM CELL, 2-TERMINAL OR 4-TERMINAL?

Kenji Araki[1)], Yasuyuki Ota[2)], Takumi Sakai[2)], Kyotaro Nakamura[3)], Kan-Hua Lee[1)], Takefumi Kamioka[1)], Kensuke Nisioka[2)], Yoshio Ohshita[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute, [2)] University of Miyazaki, [3)] Meiji University

1TuPo.10

PREPARATION AND EVALUATION OF LIQUID-PHASE-CRYSTALLIZED SILICON THIN FILMS ON GLASS FOR PHOTOVOLTAIC APPLICATION

Hiroshi Umishio[1,2)], Takuya Matsui[1)], Hitoshi Sai[1)], Takeaki Sakurai[3)], Koji Matsubara[1)]

[1)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, [2)] Graduate School of Pure and Applied Sciences, University of Tsukuba, [3)] Faculty of Pure and Applied Sciences, University of Tsukuba

1TuPo.11

SILICON-HYBRID MULTI-JUNCTION DEVICES FOR PHOTOVOLTAIC AND (PHOTO-) ELECTROCHEMICAL APPICATIONS

Arno H.M. Smets[1,2)], Paula Perez Rodriguez[1)], Johan Blanker[1)], Ravi Vasudevan[1,2)], Hairen Tan[1,3)], Miro Zeman[1)]

[1)] Photovoltaic Materials and Devices Group/Department of Electrical Sustainable Energy, Delft University of Technology, [2)] Institut National de l'Energie Solaire, [3)] Toronto University

1TuPo.12

NANOCRYSTALLINE SILICON LAYER OBTAINED THROUGH MAGNESIOTHERMIC REDUCTION OF SOILD SILICA-SUBSTRATES

Muhammad M. Islam[1)], Takeaki Sakurai[1)], Katsuhiro Akimoto[1)]

[1)] Faculty of Pure and Applied Sciences, Alliance for Research on North Africa (ARENA), University of Tsukuba

1TuPo.13

NEUTRAL-COLOR SEMI-TRANSPARENT CRYSTALLINE SILICON SOLAR CELLS

Kangmin Lee[1)], Namwoo Kim[1)], Han-don Um[1)], Kwanyong Seo[1)]

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1TuPo.14

Withdrawn

1TuPo.15

REMOVING BARRIERS TOWARD THIN CRYSTALLINE SILICON SOLAR CELLS BY IMPROVED CRACK DETECTION USING DARK-FIELD IMAGING

Sarah Wieghold[1)], Zhe Liu[1)], Luke Meyer[1)], Ashley E. Morishige[1)], Tonio Buonassisi[1)], Emanuel M. Sachs[1)]

[1)] Massachusetts Institute of Technology

1TuPo.16

DEVELOPMENT OF N-PERT SOLAR CELL USING NON MASS SEPARATION TYPE ION IMPLANTATION

Noboru Yamaguchi[1)], Daisuke Hironiwa[1)], Hideo Suzuki[1)], Kazuo Muramatsu[2)], Kyotaro Nakamura[3)]

[1)] Institute of Semiconductor and Electronics Technologies ULVAC, Inc., [2)] NAMICS CORPORATION, [3)] Meiji University

1TuPo.17

SUBMICRON TEXTURING BY WET METHOD FOR MULTICRYSTALLINE WAFERS SLICED BY DIAMOND WIRE SAW

Ying Huang[1)], Joel Li[1)]

[1)] Solar Energy Research Institute of Singapore, National University of Singapore

1TuPo.18

ENHANCEMENT OF LIGHT ABSORPTION IN PHOTOVOLTAIC DEVICES USING TEXTURED PDMS STICKERS

Inchan Hwang[1)], Deokjae Choi[1)], Kwanyong Seo[1)]

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1TuPo.19

INVESTIVATION OF SURSURFACE DAMAGE CAUSED BY DIAMOND WIRE IN CRYSTALLINE SILICON THIN WAFERS

Halubai Sekhar[1)], Tetsuo Fukuda[1)], Katsuto Tanahashi[1)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)]

[1)] Photovoltaic Power Team, Fukushima Renewable Energy Institute, National Institute of Advanced Industrial Scanice and Technology (AIST)

1TuPo.20

18.4%-EFFICIENT HETEROJUNCTION SI SOLAR CELLS USING OPTIMIZED ITO/TOP ELECTRODE

Namwoo Kim[1)], Han-Don Um[1)], Inwoo Choi[2)], Ka-Hyun Kim[2)], Kwanyong Seo[1)]

[1)] Department of Energy Engineering, Ulsan National Institute of Science and Technology, [2)] KIER-UNIST, Advanced Center for Energy, Korea Institute for Energy Research

1TuPo.21

MICRO-GRID ELECTRODE FOR SI MICROWIRE SOLAR CELLS WITH A FILL FACTOR OF OVER 80%

Jeonghwan Park[1)], Han-Don Um[1)], Inchan Hwang[1)], Namwoo Kim[1)], Kwanyong Seo[1)]

[1)] Department of Energy Engineering, Ulsan National Institute of Science and Technology (UNIST)

1TuPo.22

GRIDDLER AI ASSISTED P+ LAYER OPTIMIZATION TOWARDS LOWER SCREEN PRINTING INDUCED RECOMBINATION LOSSES FOR INDUSTRIALLY RELEVANT N- TYPE BIFACIAL SI SOLAR CELLS

Mengjie Li[1,2)], Johnson Wong[1)], Ning Chen[1)], Armin Aberle[1,2)], Rolf Stangl[1)]

[1)] Solar Energy Research Institute of Singapore, Singapore, [2)] Department of Electrical and Computer Engineering, National University of Singapore, Singapore

1TuPo.23

THERMAL STABILITY OF IN-SITU ALUMINA/TITANIA STACKS FOR BORON EMITTER PASSIVATION ON N-TYPE SILICON SOLAR CELLS

Dongchul Suh[1)]

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1TuPo.24

CHANGE IN THE ELECTRICAL CHARACTERISTICS OF A-SI FILMS AND A-SI:H/ITO INTERFACES BY BORON CAT-DOPING

Katsuya Akiyama[1)], Keisuke Ohdaira[1)]

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1TuPo.25

IMPACT OF FIRING TEMPERATURES ON HYDROGEN PASSIVATION OF RING DEFECTS IN CZOCHRALSKI SILICON

Rabin Basnet[1)], F.E. Rougieux[1)], Daniel Macdonald[1)]

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1TuPo.26

AN EFFICIENCY OVER 20% N-TYPE BIFACIAL SOLAR CELL WITH FRONT BORON EMITTER FORMED BY BBr3THERMAL DIFFUSION

Shalamujiang Simayi[1)], Yasuhiro Kida[1)], Satoshi Utsunomiya[1)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)]

[1)] Fukushima Renewable Research Center, National Institute of Advanced Industrial Science and Technology

1TuPo.27

IMPROVEMENT IN THE MINORITY CARRIER LIFETIME OF CAT-CVD SINX/C-SI STRUCTURES UNDER ROOM TEMPERATURE

Junichiro Miyaura[1)], Keisuke Ohdaira[1)]

[1)] Japan Advanced Institute of Science and Technology

1TuPo.28

LARGE DIAMETE-RATIO CZOCHRALSKI SILICON CRYSTAL GROWTH TECHNIQUE USING "LIQUINERT" SILICA CRUCIBLES

Tetsuo Fukuda[1)], Yukichi Horioka[2)], Kozo Fujiwara[3)], Katsuto Tanahashi[1)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)]

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1TuPo.29

THE EFFECT OF THE SILICON CONTENT OF ALUMINUM PASTE ON EFFICIENCY OF PERC SOLAR CELLS

Naoya Morishita[1)], Shota Suzuki[1)], Kosuke Tsuji[1)], Masahiro Nakahara[1)], Marwan Dhamrin[1)]

[1)] Toyo Aluminium K.K.

1TuPo.30

DEVELOPMENT OF P-DOPED AMORPHOUS SILICON THIN FILMS BY INDUCTIVELY COUPLED PLASMA ENHANCED CHEMICAL VAPOUR DEPOSITION

Boon Heng Teo[1,2)], Jin Liu[1)], Jia Ge[1)], Delio Perez[1)], Edwin Carmona[1)], Maryknol Delos Santos[1)], Thomas Mueller[1)]

[1)] Solar Energy Research Institute of Singapore, [2)] NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore

1TuPo.31

THE SILVER CONTACT AND FORMATION MECHANISM OF THE BORON EMITTER AND THE CURRENT FLOW MECHANISM OF THE SOLAR CELL ELECTRODE

Seunghyun Shin[1)], Soohyun Bae[1)], Sungeun Park[1)], Dongjin Choi[1)], Yoonmook Kang[1)], Hae-Seok Lee[1)], Donghwan Kim[1)]

[1)] Korea University

1TuPo.32

EVALUATION OF CARRIER COLLETION PROBABILITY IN BACK CONTACTED SILICON SOLAR CELL WITH INTERNAL QUANTUM EFFICIENCY MAPPING

Tomihisa Tachibana[1)], Katsuto Tanahashi[1)], Toshimitsu Mochizuki[1)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)]

[1)] Renewable Energy Research Center, National Institute of Advanced Industrial Science and Technology

1TuPo.33

FRONT ELECTRODE FORMATION USING ELECTROLESS LIGHT INDUCED PLATING IN THE C-SI SOLAR CELLS WITH VARIOUS ANTI-REFLECTION COATING

MYEONG SANG JEONG[1,2)], Sungjin Choi[1,2)], Min Gu Kang[2)], Jeong In Lee[2)], Donghwan Kim[1)], Hee-eun Song[2)]

[1)] Korea University, [2)] Korea Institute of Energy Research

1TuPo.34

REDUCTION OF LIGHT INDUCED DEGRADATION IN MULTICRYSTALLINE SILICON PERC SOLAR CELLS THROUGH PHOSPHORUS GETTERING

Sagnik Chakraborty[1,2)], Ying Huang[2)], Mrinalini Padmanabhan[2)], Armin Gerhard Aberle[1,2,3)], Joel Bingrui Li[2)]

[1)] NUS Graduate School for Integrative Sciences and Engineering, National University of Singapore, [2)] Solar Energy Research Institute of Singapore, National University of Singapore, [3)] Dept. of ECE, National University of Singapore

1TuPo.35

CHEMICALY RESITTIVE AND HIGH QUALITY TRASPARENT SILICON NITRIDE PASSIVATION LAYERS FOR BACK-CONTACT CRYSTALLINE SILICON SOLAR CELLS

Huynh Thi Cam Tu[1)], Koichi Koyama[1)], Cong Thanh Nguyen[1)], Shigeki Terashima[1)], Takeo Konishi[1)], Keisukei Ohdaira[1)], Hideiki Matsumura[1)]

[1)] Japan Advanced Institute of Science and Technology

1TuPo.36

HIGH EFFICIENCY TANDEM SOLAR CELL WITH CARRIER SELECTIVE CONTACT

Sk Md Iftiquar[1)], Shihyun Ahn[1)], Jaehyun Cho[2)], Junhee Jung[2)],

Jinjoo Park[1)], Sangho Kim[2)], Junsin Yi[1)]

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1TuPo.37

FULLY ION IMPLANTED INTERDIGITATED BACK CONTACT SILICON SOLAR CELL

Katsuto Tanahashi[1)], Masaaki Moriya[1)], Tomihisa Tachibana[1)], Yasuhiro Kida[1)], Satoshi Utsunomiya[1)], Tetsuo Fukuda[1)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)]

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1TuPo.38

INVESTIGATION OF DEGREADATION MECHANISMS ORGINATING NEAR OHMIC ELECTRODES

Jonathon Mitchell[1)]

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1TuPo.39

ELECTRODEPOSITION OF SI THIN FILMS IN IONIC LIQUID WITH GROWTH CONTROL FROM INITIAL STAGES

Hidenori Takai[1)], Yasuhiro Tsuyuki[1)], Tatsuki Fujimura[1)], Masahiro Kunimoto[2)], Yasuhiro Fukunaka[2)], Piero Pianetta[3)], Takayuki Homma[1,2)]

[1)] Department of Applied Chemistry, Waseda University, [2)] Research Organization for Nano & Life Innovation, Waseda University, [3)] SLAC National Accelerator Laboratory

1TuPo.40

HIGHLY EFFICIENT RADIAL-JUNCTION MICROWIRE SOLAR CELLS BY ACID BASED DOPING PROCESS

Wonjoo Jin[1)], Inchan Hwang[1)], Kwanyong Seo[1)]

[1)] Energy Engineering, Ulsan National Institute of Science and Technology

1TuPo.41

PASSIVATION PROPERTIES OF AL2O3/SIOX/SI(100) BY USING WET CHMICAL OXIDATION FOR CRYSTALLINE SI SOLAR CELL APPLICATION

Kwan Hong Min[1,2)], Sungjin Choi[1,2)], Myeong Sang Jeong[1,2)], Min Gu Kang[2)], Jeong In Lee[2)], Donghwan Kim[1)], Hee-eun Song[2)]

[1)] Korea University, [2)] Korea Institute Energy Research

1TuPo.42

Passivation of crystalline Si surfaces with small textures by Cat-CVD SiNx films

Jing Liu[1)], Seimei Akagi[2)], Yuzo Yamamoto[2)], Keisuke Ohdaira[1)]

[1)] Japan Advanced Institute of Science and Technology, [2)] Settsu Oil Mill

1TuPo.43

Kerfless wafering of crystalline silicon by proton implantation exfoliation and its application for solar cells

Hyeon-Seung Lee[1)], Jaekwon Suk[1)], Joonkon Kim[1)], Jonghan Song[1)], Doo Seok Jeong[1)], Jong-Keuk Park[1)], Won Mok Kim[1)], Taek Sung Lee[1)], Inho Kim[1)]

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1TuPo.44

OPTOELECTRICAL PROPERTIES OF PULSED DC MAGNETRON SPUTTER DEPOSITED CERIUM-DOPED INDIUM OXIDE THIN FILMS FOR PV APPLICATIONS

Krishanu Dey[1)], Xia Yan[1)], Stella Van Eek[3)], Sascha Kreher[3)], Armin Gerhard Aberle[1,2)], Selvaraj Venkataraj[1)]

[1)] Solar Energy Research Institute of Singapore, National University of Singapore, Singapore, [2)] Department of Electrical and Computer Engineering, National University of Singapore, Singapore, [3)] FHR Anlagenbau GmbH, Germany

1TuPo.45

FABRICATION OF COPPER IODIDE BY 2-STEP METHOD AS HOLE SELECTIVE CONTACT FOR CRYSTALLINE SILICON SOLAR CELL -A POTENTIAL ALTERNATIVE TO AMORPHOUS SILICON HETEROJUNCTION-

Min Cui[1)], Kazuhiro Gotoh[1)], Isao Takahashi[1)], Yasuyoshi Kurokawa[1)], Noritaka Usami[1)]

[1)] Graduate School of Engineering, Nagoya University

1TuPo.46

INFLUENCE OF PSEUDO FIRING PROCESS ON ELECTRICAL PROPERTY OF SINX/SI STRUCTURE

Hidenobu Mori[1)], Yuki Horikawa[1)], Iruro Matsumoto[1)], Koji Arafune[1)], Shin-ich Satoh[1)], Haruhiko Yoshida[1)]

[1)] Department of Electrical Materials and Engineering, University of Hyogo

1TuPo.47

IMPROVING SILICON-NANOPARTICLE DENSITY USING THE PRESS METHOD FOR APPLICATION TO THE DOPING LAYER OF SILICON SOLAR CELLS

Shinya Kato[1)], Eiji Ichihara[1)], Naoki Kishi[1)], Tetsuo Soga[1)]

[1)] Depertment of electrical and Mechanical Engineering, Nagoya Institute of technology

1TuPo.48

STUDY ON CHEMICAL BONDING STATES AT ELECTRODE-SILICON INTERFACE FABRICATED WITH FIRE-THROUGH CONTROL PASTE

T. Hiyama[1)], T. Kojima[1)], K. Kinoshita[1)], T. Nishihara[1)], K. Onishi[1)], K. Muramastu[2)], A. Tanaka[2)], Y. Ohshita[3)], A. Ogura[1)]

[1)] Meiji University, [2)] NAMICS Corporation, [3)] Toyota Tech. Inst.

1TuPo.49

THIN WAFER AND LOW KERF-LOSS DIAMOND MULTI-WIRE SAW

Tomoyuki Kawatsu[1)], Yoshio Ohshita[2)], Kyotaro Nakamura[3)], Atsushi Ogura[3)]

[1)] Komatsu NTC Ltd., [2)] Toyota Technological Institute, [3)] Meiji University

1TuPo.50

PASSIVATION PROPERTIES OF AlOx FILMS DEPOSITED BY LOW-INDUCTANCE- ANTENNA ASSISTED REACTIVE SPUTTERING

Yuki Miki[1)], Toshiya Marukane[1)], Takashi Harada[1)], Yasushi Hotta[1)], Haruhiko Yoshida[1)], Kouji Maeda[1)], Koji Arafune[1)]

[1)] Department of Chemical Engineering, University of Hyogo

1TuPo.51

IMPACT OF BORON INCORPORATION ON PROPERTY OF SI SOLAR CELLS EMPLOYING P-TYPE POLY-SI BY ALUMINUM INDUCED CRYSTALIZATION

Shota Masuda[1)], Kazuhiro Gotoh[1)], Isao Takahashi[1)], Kyotaro Nakumura[2)], Yoshio Ohshita[3)], Noritaka Usami[1)]

[1)] Graduate School of Engineering, Nagoya University, [2)] Meiji University, [3)] Toyota Technological Institute

1TuPo.52

ENHANCED CRYSTALLINE SILICON SURFACE PASSIVATION BY LIQUID BASED METAL OXIDE CAPPING

Fen LIN[1)], Xinhang LI[1,2)], Zhi Ming KAM[1)], Mei Gi TOH[1)], Armin G. ABERLE[1,2)], Thomas GASCOU[1)]

[1)] Solar Energy Research Institute of Singapore, National University of Singapore, [2)] Department of Electrical and Computer Engineering, National University of Singapore

1TuPo.53

PLATING METALLIZATION PROCESS FOR SILICON HETERO JUNCTION SOLAR CELL

Yui Tomomatsu[1)], Masahiro Fujiwara[1)], Shoya Iuchi[1)]

[1)] ISHIHARA CHEMICAL CO., LTD.

1TuPo.54

FABRICATION AND ANALYSIS OF THE KERF-LESS ULTRA-THIN SI WAFER USING A CONTROLLED CRACK PROPGATION METHOD

Jihun Oh[1)], Yong Hwan Lee[1)]

[1)] Graduate School of EEWS (Energy, Environment, Water and Substantiality), KAIST

1TuPo.55

PERC DESIGN CONSIDERATION OF LASER ABLATION PATTERN FOR HIGHER EFFICIENCY CRYSTALLINE SILICON SOLAR CELLS

Donny Lai[1)], Chuan Seng Tan[1)], Maria Luz Loria Manalo[1)], Pun Chong Ang[1)], Joel Li Bingrui[1)]

[1)] Silicon Materials and Cell Cluster, Solar Energy Research Institute of Singapore, National University of Singapore

1TuPo.56

SILICON DOPING PERFORMED BY PECVD METHOD FOR SOLAR CELL APPLICATIONS

Junhee Jung[1)], Changsoon Han[2)], Sungjae Bong[2)], Junsin Yi[1)]

[1)] Department of Energy Science, Sungkyunkwan University, [2)] Laser advanced system industrialization center

1TuPo.57

NUMERICAL SIMULATION OF THE EFFECT OF HEATER CONFIGURATION ON THE GROWTH OF POLYCRYSTALLINE SILICON INGOT BY HEAT EXCHANGER METHOD

Sanghoon Lee[1)], Woo Kyoung Kim[1)], Chinho Park[1)]

[1)] Yeungnam University

1TuPo.58

CHARACTERIZATION OF OXYGEN-RELATED DEFECTS IN SILICON USING CORRELATIVE MICROSCOPY

Withdrawn

Amanda Youssef[1)], Erin E. Looney[1)], Mindy A. Jensen[1)], Sarah Wieghold[1)], Jeremy P. Dexter[1)], Barry Lai[2)], Tonio Buonassisi[1)]

[1)] Department of Mechanical Engineering, Massachusetts Institute of Technology, [2)] Advanced Photon Source, Argonne National Laboratory

1TuPo.59

HIGHLY TRANSPARENCY AND HIGH MOBILITY BILAYER ALUMINUM DOPED ZINC OXIDE FILMS ON PERIODIC TEXTURED GLASS MORPHOLOGY FOR THIN FILM SILICON SOLAR CELLS

Hyeongsik Park[1,3)], Anh Huy Tuan Le[1)], Youn-Jung Lee[1)], Junhee Jung[2)], Duy Phong Pham[1)], Jaehyun Cho[1)], Junsin Yi[1)]

[1] College of Information and Communication Engineering, Sungkyunkwan University, [2] Department of Energy Science, Sungkyunkwan University, [3] KETI, Electronic Convergence Materials and Device Research Center

1TuPo.60

Single Side doped a-Si (poly-Si) and TCO PECVD for Passivated Contact Technology

Thomas Grosse[1], Hans-Peter Sperlich[1], Daniel Decker[1], Marcel König[1]

[1] Process Development, Meyer Burger (Germany) AG

1TuPo.61

EFFECT OF REAR PASSIVATION AND LOCAL BACK CONTACT FOR HIGH EFFICIENCY c-Si SOLAR CELL

Jeong Eun Park[1], Minji Lee[2], Sangmuk Kang[2], Hye Kwon Hong[2], Young Ho Cho[2], Donggun Lim*[1,2]

[1] Department of Electronic Engineering, Korea National University of Transportation, [2] Department of IT Convergence, Korea National University of Transportation

1TuPo.62

OPTIMIZATION OF REACTIVE ION ETCHING FOR BLACK SILICON

Minji Lee[1], Jeong Eun Park[2], Sangmuk Kang[1], Hye Kwon Hong[1], Young Ho Cho[1], Donggun Lim*[1,2]

[1] Department of IT Convergence, Korea National University of Transportation, [2] Department of Electronic Engineering, Korea National University of Transportation

1TuPo.63

A NOVEL OPTIMIZATION METHOD FOR BORON SPIN-ON DOPANT DIFFUSED EMITTER OF N-TYPE CRYSTALLINE SILICON SOLAR CELL BASED ON SILICON OXIDE NANOSPHERES

Qingzhu Wei[1,2], Shuanglong Yu[2], Shude Zhang[1], Honglie Shen[2], Zhichun Ni[1,2]

[1] Suzhou Talesun Solar Technologies Co., Ltd., [2] Nanjing University of Aeronautics and Astronautics

1TuPo.64

High-efficiency (>17%) Si-PEDOT:PSS hybrid solar cells by concurrent structural, electrical, and interfacial engineering via low temperature processes

Dahl-Young Khang[1]

[1] Department of Materials Science and Engineering, Yonsei University

1TuPo.65

OPTIMIZATION OF Ni / Cu PLATING PROCESS FOR GHOST PLATING-FREE SOLAR CELL

Hye Kwon Hong[1], Jeong Eun Park[2], Minji Lee[1], Sangmuk Kang[1], Young Ho Cho[1], Donggun Lim*[1,2]

[1] Department of IT convergence, Korea National University of Transportation, [2] Department of Electronic Engineering, Korea National University of Transportation

1TuPo.66

EFFECT OF PICOSECOND LASER PROCESS FOR CUTTING CELL

Young Ho Cho[1], Jeong Eun Park[2], Minji Lee[1], Sangmuk Kang[1], Hye Kwon Hong[1], Donggun Lim*[1,2]

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1TuPo.67

PICOSECOND LASER-ASSISTED SPALLING PROCESS FOR ULTRA-THIN WAFER

Kang Sangmuk[1], Park Jeong Eun[2], Yang Hyun Seock[3], Lim Jae Hong[3], Lim Donggun[1,2]

[1] Department of IT Convergence, Korea National University of Transportation, [2] Department of Electronic Engineering, Korea National University of Transportation, [3] Korea Institute of Material Science

1TuPo.68

INFLUENCE OF ITO-RPD PROCESS ON EFFECTIVE MINORITY CARRIER LIFETIME IN REACTIVE PLASMA DEPOSITED ITO/ SIO2/SI STRUCTURE

Yuki Isogai[1], Takefumi Kamioka[1], Hyunju Lee[1], Nobuaki Kojima[1], Yoshio Ohshita[1]

[1] Toyota Technological Institution

Tuesday, November 14
16:00-18:00 Room7+8+9 **Area2**

2TuPo.69

CHARACTERIZATION OF FLEXIBLE CIGS THIN FILM SOLAR CELLS ON STAINLESS STEEL SUBSTRATE

Chae-Woong Kim[1)], Jihye Kim[1)], Hyung Sang Park[1)], Jin Hyeok Kim[2)], Chaehwan Jeong[3)]

[1)] R&D Center ISAC Research Inc., [2)] Chonnam University, [3)] KITECH

2TuPo.70

PROPERTIES AND CHARACTERIZATION OF TIN SULFIDE THIN FILMS GROWN BY ATOMIC LAYER DEPOSITION

Jihye Kim[1)], Chae Woong Kim[1)], Hyung Sang Park[1)], Young Duck Tak[1)]

[1)] Research & Development team, ISAC Research Inc.

2TuPo.71 ► 2WeO3.3

2TuPo.72

FABRICATION OF SUBSTRATE-TYPE CDTE THIN-FILM SOLAR CELLS BY CLOSE-SPACED SUBLIMATION

Tamotsu Okamoto[1)], Ayuki Murata[1)], Yusuke Hayashi[1)], Yasuyoshi Shiina[1)], Ryousuke Ishikawa[2)], Nozomu Tsuboi[2)]

[1)] Department of Electrical and Electronic Engineering, National Institute of Technology, Kisarazu College, [2)] Niigata University

2TuPo.73 ► 2WeO4.3

2TuPo.74

INVESTIGATION OF Cu2ZnSnS4 (CZTS) AND Cu2SnS3 (CTS) CELLS WITH HIGH PHOTOVOLTAIC PROPERTIES

Shin Tajima[1)], Mitsutaro Umehara[1)], Yasuhiko Takeda[1)], Kazuo Higuchi[1)], Tatsuo Fukano[1)], Ryoji Asahi[1)], Hirofumi Hazama[1)], Keita Kataoka[1)], Masaki Hasegawa[1)], Tomoyoshi Motohiro[1)]

[1)] Materials and Process Research Program, Toyota Central R&D Labs., Inc.

2TuPo.75

INVESTIGATON ON BORON-DOPED P-BASI2/N-SI HETERO-JUNCTION SOLAR CELLS ON A TEXTURED SI(001) SUBSTRATE

Tianguo Deng[1)], Kazuhiro Gotoh[2)], Ryota Takabe[1)], Zhihao Xu[1)], Suguru Yachi[1)], Yudai Yamashita[1)], Kaoru Toko[1)], Noritaka Usami[2)], Takashi Suemasu[1)]

[1)] Institute of Applied Physics, University of Tsukuba, [2)] Nagoya University

2TuPo.76

Fabrication of (Cu,Ag)2SnS3 thin film solar cells by sulfurization from stacked NaF/Sn/(Cu+Ag) precursors

Mitsuki Nakashima[1)], Koichi Hatayama[1)], Toshiyuki Yamaguchi[1)], Hideaki Araki[2)], Shigeyuki Nakamura[3)], Satoru Seto[4)], Yoji Akaki[5)], Junji Sasano[6)], Masanobu Izaki[6)]

[1)] National Institute of Technology, Wakayama College, [2)] National Institute of Technology, Nagaoka College, [3)] National Institute of Technology, Tsuyama College, [4)] National Institute of Technology, Ishikawa College, [5)] National Institute of Technology, Miyakonojo College, [6)] Toyohashi University of Technology

2TuPo.77

Effect of KF addition to Cu2SnS3 thin film by two-stage annealing

Mitsuki Nakashima[1)], Junya Ue[1)], Toshiyuki Yamaguchi[1)], Junji Sasano[2)], Masanobu Izaki[2)]

[1)] National Institute of Technology, Wakayama College, [2)] Toyohashi University of Technology

2TuPo.78

NITROGEN-DOPED BASI2 THIN FILM ON N-SI (111) BY MOLECULAR BEAM EPITAXY AND RADIO-FREQUENCY PLASMA GENERATOR

Zhihao Xu[1)], Tianguo Deng[1)], Ryota Takabe[1)], Kaoru Toko[1)], Takashi Suemasu[1)]

[1)] Institute of Applied Physics Graduate School of Pure and Applied Scicences, University of Tsukuba

2TuPo.79

RECOMBINATION ANALYSIS OF CU2SNS3 SOLAR CELLS WITH DIFFERENT NAF THICKNESS

Kanta Tai[1)], Jakapan Chantana[1)], Takashi Minemoto[1)]

[1)] Department of Science and Engineering, Ritsumeikan University

2TuPo.80

INFLUENCE OF ANNEALING IN SULFUR FLUX ON CZTS FORMATION BY USING MOLECULAR BEAM EPITAXY SYSTEM

Yosuke Shimamune[1)], Kazuo Jimbo[1)], Genki Nishida[1)], Masanari Murayama[1)], Akiko Takeuchi[1)], Hironori Katagiri[1)]

[1)] Dapartment of Electrical and Electronic System Engineering, National Institute of Technology, Nagaoka College

2TuPo.81

OPEN CIRCUIT VOLTAGE IMPROVEMENT OF SPRAY-PYROLYZED CU2ZNSN4 THIN FILM SOLAR CELLS BY SILVER DOPING

Thi Hiep Nguyen[1)], Takashi Harada[1)], Jakapan Chantana[2)],

Takashi Minemoto[2)], Shuji Nakanishi[1)], Shigeru Ikeda[3)]

[1)] Research Center for Solar Energy Chemistry, Osaka University, [2)] Ritsumeikan University, [3)] Konan University

2TuPo.82

FEASIBILITY STUDY OF WIDE-GAP CHALCOPYRITE TOP CELLS FOR HIGH EFFICIENCY TANDEM PHOTOVOLTAICS

Soichiro Shibasaki[1)], Sara Yoshio[1)], Naoyuki Nakagawa[1)], Yuya Honishi[2)], Kazushige Yamamoto[1)]

[1)] Research & Development Center, Toshiba Corp., [2)] Toshiba Corp.

2TuPo.83

IMPACT OF BA/SI FLUX RATIO DURING MOLECULAR BEAM EPITAXY GROWTH ON THE CHARACTERISTICS OF BASI2 EPITAXIAL FILMS ON SI(111)

Ryota Takabe[1)], Tianguo Deng[1)], Komomo Kodama[1)], Yudai Yamashita[1)], Kaoru Toko[1)], Takashi Suemasu[1)]

[1)] Institute of Applied Physics, University of Tsukuba

2TuPo.84

IMPACT OF ANNEALING TEMPERATURE PROFILE ON THE FORMATION OF CZTSSe ABSORBER LAYER

UDAI P. SINGH[1)], Srinibasa Padhy[1)], Vishvas Kumar[1)], S. Bhattacharya[2)]

[1)] SCHOOL OF ELECTRONICS ENGINEERING, KIIT UNIVERSITY, [2)] School of Energy Studies, The Neotia University

2TuPo.85

STUDY OF STRUCTURAL AND ELECTRICAL PROPERTIES OF Cu2SnS3 AND Cu2SnSe3 THIN FILM DEPOSITED FROM SOLID SOLUTION

UDAI P. SINGH[1)], Arindam Basak[1,2)], Himanghshu Deka[1)], Anup Mondal[2,3)]

[1)] School of electronics engineering, KIIT UNIVERSITY, [2)] Centre of Excellence for Green Energy&Sensor Systems, IIEST, [3)] Department of Chemistry, IIEST

2TuPo.86

TEMPERATURE-DEPENDENT ABSORPTION SPECTRA OF CU2SNS3 THIN FILMS

Naoya Aihara[1)], Hideaki Araki[2)], Kunihiko Tanaka[1)]

[1)] Department of Electrical, Electronics and Information Engineering, Nagaoka University of Technology, [2)] National Institute of Technology, Nagaoka Collge

2TuPo.87

CHARACTERIZATION OF CDSNP2/ZNSNP2 P-N JUNCTION

Shigeru Nakatsuka[1)], Yoshitaro Nose[1)]

[1)] Department of Materials Science and Engineering, Kyoto University

2TuPo.88

EFFICIENCY IMPROVEMENT OF ZNSNP2 WAFER-BASED SOLAR CELL BY (CD,ZN)S BUFFER LAYER

Syunsuke Akari[1)], Jakapan Chantana[1)], Shigeru Nakatsuka[2)], Yoshitaro Nose[2)], Takashi Minemoto[1)]

[1)] Department of Electrical and Electronic Engineering, Ritsumeikan University, [2)] Kyoto University

2TuPo.89

DEVICE MODELING OF IRON PYERITE SOLAR CELL FOR HIGH CONVERSION EFFICINECY

Shunsuke Uchiyama[1)], Yasuaki Ishikawa[1)], Yukiharu Uraoka[1)]

[1)] Graduate School of Materials Science, Nara Institute of Science and Technology

2TuPo.90

EARTH-ABUNDANT AND NON-TOXIC CuSbS2 THIN FILMS FOR PHOTOVOLTAICS – EFFECT OF Cu/Sb RATIO

Chalapathi Uppala[1)], Poornaprakash Bathalavaram[1)], Si-Hyun Park[1)]

[1)] Department of Electronic Engineering, Yeungnam University

2TuPo.91

SIMULATION BASED OPTIMIZATION OF CZTS SOLAR CELL EFFICIENCY

Atul Kumar[1)], Ajay D. Thakur[1)]

[1)] Department of Physics, Indian Institute of Technology Patna

2TuPo.92

INVESTIGATION INTO HEAT TREATMENT CONDITION OF CZTS THIN FILM

Tatsuya Araki[1)], Takahiro Maeda[1)], Kazuo Jimbo[1)], Yosuke Shimamune[1)], Hironori Katagiri[1)]

[1)] Department of Electrical and Electronic Systems Engineering, National Institute of Technology, Nagaoka College

2TuPo.93

FABRICATION OF CZTS THIN FILMS BY USING STACKED PRECURSORS

Takahiro Maeda[1)], Tatsuya Araki[1)], Kazuo Jimbo[1)], Yosuke Shimamune[1)], Hironori Katagiri[1)]

[1)] Department of Electrical and Electronic Systems Engineering, National Institute of Technology, Nagaoka College

2TuPo.94

RELATION OF BANDGAP GRADING WITH CARRIER RECOMBINATION IN Cu(In,Ga)Se2 BASED SOLAR CELLS

Yuta Ando[1)], Shogo Ishizuka[2)], Shenghao Wang[1)], Jingdong Chen[1)], Muhammad Monirul Islam[1)], Hajime Shibata[2)], Katsuhiro Akimoto[1)], Takeaki Sakurai[1)]

[1)] University of Tsukuba, [2)] National Institute of Advanced Industrial Science and Technology

2TuPo.95

DIAGNOSIS OF EXTERNALLY INDUCED SPATIALLY-RESOLVED STRAIN IN GAAS THIN-FILM SOLAR CELLS BY ELECTROLUMINESCENCE IMAGING METHOD

Xiaobo Hu[1)], Liangqing Zhu[1)], Guoen Weng[1)], Shaoqiqng Chen[1)]

[1)] Department of Electronic Engineering, East China Normal University

2TuPo.96

DEFECT PROPERTIES OF GROUP-V ELEMENTS DOPED CADMIUM TELLURIDE SINGLE CRYSTALS

Akira Nagaoka[1,3)], Kenji Yoshino[2)], Yoshitaro Nose[1)], Michael A. Scarpulla[3)]

[1)] Department of Materials Science and Engineering, Kyoto University, [2)] University of Miyazaki, [3)] University of Utah

2TuPo.97

Enhancement in Voc and Jsc of narrow-gap a-SiGe:H solar cells by amorphous silicon oxide buffer layer

Duy Phong Pham[1)], Sangho Kim[2)], Jinjoo Park[1)], Jaehyun Cho[2)], Junhee Jung[2)], Anh Huy Tuan Le[1)], Junsin Yi[1)]

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2TuPo.98

GROWTH AND CHARACTERIZATION OF CDS NANOSTRUCTURES AND BI NANOPARTICLES

Patricia Gutierrez Zayas-Bazán[1)], Karla Gutierrrez Zayas-Bazán[1)], Osvaldo de Melo [2)], Miguel Tufiño-Velázquez[1)], Gerardo S. Contreras-Puente[1)]

[1)] Escuela Superior de Física y Matemáticas, Instituto Politécnico Nacional, Unidad Profesional "ALM", [2)] Facultad de Física, Universidad de La Habana

2TuPo.99

ULTRA-THIN SOLAR CELLS OF CDS/CDTE AS PROCESSED BY THE MAGNETO- PLANAR-SPUTTERING (MPS) TECHNIQUE.

Karla Gutierrez Z-B[1)], Francisco de Moure Flores[2)], Patricia Gutierrez Zayas-Bazán[1)], Daniel Jiménez-Olarte[1)], Jorge Sastré-Hernández[1)], Jorge R. Aguilar-Hernández[1)], Concepcin Mejía-García[1)], Gerardo Contreras-Puente[1)]

[1)] Escuela Superior de Física y Matemáticas, Instituto Politécnico Nacional, [2)] Facultad de Química-Materiales, Universidad Autónoma de Querétaro,

2TuPo.100

CHARACTERIZATION OF ELECTRONIC STRUCTURE OF GRAIN BOUNDARIES IN CIGSSe AND CIGSSe ABSORBERS BY KELVIN PROBE FORCE MICROSCOPY

Shingo Kubo[1)], Tsuyoshi Sawada[1)], Takuya Shimamura[1)], Takuya Kato[2)], Hironori Sugimoto[2)], Shogo Ishizuka[3)], Hajime Shibata[3)], Koji Matsubara[3)], Shigeru Niki[3)], Norio Terada[1)]

[1)] Kagoshima University, [2)] Solar Frontier K.K., [3)] AIST

2TuPo.101

STRUCTURAL AND ELECTRIC PROPERTIES OF CUSBS2 COMPOUND BULK CRYSTAL

Takato Kawaguchi[1,3)], Naoki Ilyama[1)], Yuriko Koda[2)], Takashi Harada[2)], Shuji Nakanishi[2)], Shigeru Nakatsuka[3)], Yoshitaro Nose[3)], Shigeru Ikeda[1)]

[1)] Department of Materials Chemistry, Konan University, [2)] Osaka University, [3)] Kyoto University

2TuPo.102

PRECISE COMPOSITION CONTROL OF CZTS THIN FILMS BY STACKED COPPER-TIN TOP LAYER

Kazuo Jimbo[1)], Yosuke Shimamune[1)], Yuko Satou[1)], Hironori Katagiri[1)]

[1)] Department of Electrical and Electronic Systems Engineering, National Institute of Technology, Nagaoka College

2TuPo.103

FORMATION OF SINGLE-PHASE TIN SULFIDE ABSORBER LAYER FOR THIN FILM SOLAR CELL

Dajeong Lee[1)], Jaeyeong Heo[1)]

[1)] Department of Materials Science and Engineering, and Optoelectronics Convergence Research Center, Chonnam National University

2TuPo.104

FABRICATION OF FeOOH/FeS2 HETERO JUNCTIONS BY ELECTROCHEMICAL DEPOSITION AND SULFUR ANNEALING

Sayaka Maki[1)], Masaya Ichimura[1)]

[1)] Nagoya Institute of technology

2TuPo.105

DEPENDENCE OF SOLAR CELL CHARACTERISTICS ON SI SUBSTRATE PRETREATMENT

Yudai Yamashita[1)], Ryota Takabe[1)], Kaoru Toko[1)], Takashi Suemasu[1)]

[1)] University of Tsukuba

2TuPo.106

INFLUENCE OF DIFFERENT SURFACE CLEANING METHODS ON CIGS SOLAR CELLS PREPARED BY TWO-STAGE PROCESS

Xue Zheng[1,3)], Xuan Sang Nguyen[2)], Xia Yan[1)],
Armin Gerhard Aberle[1,3)], Selvaraj Venkataraj[1)]

[1)] Solar Energy Research Institute of Singapore, National University of Singapore, [2)] Singapore MIT Alliance for Research and Technology, [3)] Department of Electrical&Computer Engineering, National University of Singapore

2TuPo.107

FABRICATION OF TIN MONOSULFIDE FILMS BY REACTION DIFFUSION

Koki Iwata[1)], Ryoji Katsube[1)], Shigeru Nakatsuka[1)], Yoshitaro Nose[1)]

[1)] Kyoto University

2TuPo.108

EFFECT OF SURFACE TREATMENT ON THE CZTS THIN FILMS USING A SODIUM HYPOCHLORITE

Hisashi Miyazaki[1)], Daichi Yamasaki[1)], Masami Aono[1)],
Hiroaki Kishimura[1)], Kazuo Jimbo[2)], Hironori Katagiri[2)]

[1)] National Defense Academy, [2)] National Institute of Technology, Nagaoka College

2TuPo.109

CRYSTALLOGRAPHIC, OPTICAL AND ELECTRONIC PROPERTIES OF (Cu, Li)In(S,Se)2 SYSTEM

Takahiro Kusumoto[1)], Tsuyoshi Maeda[1)], Takahiro Wada[1)]

[1)] Department of Materials Chemistry, Ryukoku University

2TuPo.110

SUPPRESSION OF SECONDARY PHASE WITH CZTS BY TIN INCORPORATION USING MOLECULAR BEAM EPITAXY SYSTEM

Genki Nishida[1)], Masanari Murayama[1)], Akiko Takeuchi[1)],
Yosuke Shimamune[1)], Kazuo Jimbo[1)], Hironori Katagiri[1)]

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2TuPo.111

ELECTRODEPOSITED CUPROUS OXIDE ON VARIOUS SUBSTRATES FOR SOLAR CELL APPLICATIONS

MAN HIEU TRAN[1)], Jae Yu Cho[1)], Jaeyeong Heo[1)]

[1)] Department of Materials Science and Engineering, and Optoelectronics Convergence Research Center, Chonnam Natioanl University

2TuPo.112

Effect of RF power on the properties of Al-doped ZnO (AZO) thin films and their application to Cu2ZnSn(S, Se)4 thin film solar cells

Jun Sung Jang[1)], Jin Hyeok Kim[1)]

[1)] Department of Materials Science and Engineering, Chonnam National University

2TuPo.113

CdTe SOLAR CELLS REDUCED IN CADMIUM

MARIA DE LOURDES ALBOR AGUILERA[1,2)],
UZIEL GALARZA GUTIERREZ[1)],
CESAR HERNANDEZ VASQUEZ[1)],
JOSE MANUEL FLORES MARQUEZ[3)],
JUANA ANGELICA ORTEGA CARDENAS[1)],
MIGUEL ANGEL GONZALEZ TRUJILLO[2)]

[1)] FISICA INSTITUTO POLITECNICO NACIONAL, [2)] INSTITUTO POLITECNICO NACIONAL-ESFM, [3)] INSTITUTO POLITECNICO NACIONAL-ESIQIE

2TuPo.114

Surface effects of CIGS thin films between one-step sputtering and co-evaporation process on cell efficiency characterized by scanning probe microscopy

Jae-Cheol Park[1)], Mowafak Al-Jassim[2)], Tae-Won Kim[1)]

[1)] Applied optics and energy research group, Korea Institute of Industrial Technology, [2)] National Renewable Energy Laboratory

2TuPo.115

Low-temperature growth of Cu(In,Ga)Se2 thin films using a CuIn liquid flux in co-evaporation process

Seung Tae Kim[1)], Sun Hong Moon[1)], Huiling Cui[1)], Byung Tae Ahn[1)]

[1)] Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology

2TuPo.116

THE PROPERTIES OF ZnS THIN FILM WITH DIFFERENT COMPLEXING AGENT FOR CIGS SOLAR CELL

Sang Yong Park[1)], Jeong Eun Park[2)], Taewoo Eom[1)],
Jung Hoon Park[1)], Jackson Bweupe[1)], Donggun Lim*[1,2)]

[1] Department of IT Convergence, Korea National University of Transportation, [2] Department of Electronic Engineering, Korea National University of Transportation

Tuesday, November 14
16:00-18:00 Room7+8+9 **Area3**

3TuPo.117

PYPVCELL – OPEN-SOURCED SOLAR CELL MODELING TOOLKIT IN PYTHON LANGUAGE

Kan-Hua Lee[1], Kenji Araki[1], Nobuaki Kojima[1], Masafumi Yamaguchi[1]

[1] Toyota Technological Institute

3TuPo.118

GROWTH OF InGaAs(P) IN PALANETARY MOVPE REACTOR USING TBA AND TBP FOR PHOTOVOLTAIC APPLICATIONS

Hassanet Sodabanlu[1], Kentaroh Watanabe[1], Masakazu Sugiyama[1], Yoshiaki Nakano[2]

[1] Research Center for Advanced Science and Technology, The University of Tokyo, [2] The University of Tokyo

3TuPo.119

EFFECT OF (IN)GAASN BUFFER LAYER ON DISLOCATION DENSITY FOR LATTICE-MISMATCHED HETERO-EPITAXIAL (IN)GAAS FILM

Omar Elleuch[1], Yu-Cian Wang[1], Nobuaki Kojima[1], Yoshio Ohshita[1], Masafumi Yamaguchi[1]

[1] Toyota Technological Institute

3TuPo.120

GALLIUN ASERNIDE ON SILICON WITH A LOW-TEMPERATRE BUFFER LAYER GROWN BY MIGRATION-ENHANCED EPITAXY

Yu-Cian Wang[1], Omar Elleuch[1], Akio Yamamoto[2], Nobuaki Kojima[1], Yoshio Ohshita[1], Masafumi Yamaguchi[1]

[1] Toyota Technological Institute, [2] University of Fukui

3TuPo.121

INFLUENCE OF LASER ANNEALING ON CRYSTAL QUALITY OF GaAs THIN FILMS GROWN ON SI (001) SUBSTRATE

Kenji Kaino[1], Hiroki Yoshidome[1], Koji Maeda[1], Tetsuo Ikari[1], Atsuhiko Fukuyama[1], Hidetoshi Suzuki[1]

[1] Miyazaki University

3TuPo.122

THE EFFECTS OF Ga PRE-EVAPORATION ON THE CRYSTAL QUALITY OF GaAs THIN FILM GROWN ON Si (113) BY MOLECULAR BEAM EPITAXY

Tetsu Okuya[1], Masaya Yuki[1], Tetsuo Ikari[1], Atsuhiko Fukuyama[1], Hidetoshi Suzuki[1]

[1] Miyazaki University

3TuPo.123

INVESTIGATION OF EPITAXIAL GROWTH OF GALLIUM ARSENIDE THIN FILMS BY MAGNETRON SPUTTERING DEPOSITION

Sheng-Hui Chen[1], Chia-Yin Chen[1], Chiu-Yi Shin[1], Chu-Jian Lin[1], Shao-Ze Tseng[1], Chao-Yang Tsao[1,2]

[1] Department of Optics and Photonics, National Central University, [2] Taiwan Power Company

3TuPo.124

CURRENT-MATCHED DESIGN OF GAAS//SI DUAL JUNCTION SOLAR CELLS INTEGRATED BY SURFACE ACTIVATED WAFER BONDING

Kentaroh Watanabe[1], Hassanet Sodabanlu[1], Yoshiaki Nakano[1,2], Masakazu Sugiyama[1,2], Kasidit Toprasertpong[2]

[1] Research Center for Advanced Science and Techonology, University of Tokyo, [2] School of Engineering, University of Tokyo

3TuPo.125

DERIVING EXTERNAL QUANTUM EFFICIENCY OF SOLAR CELLS FROM PHOTLUMINESCENCE MEASUREMENT

Akio Ogura[1], Tetsuya Nakamura[1], Mitsuru Imaizumi[1], Shin-ichiro Sato[2], Takeshi Ohshima[2]

[1] Japan Aerospace Exploration Agency, [2] National Institutes for Quantum and Radiological Science and Technology

3TuPo.126

EFFECT OF LIGHT IRRADIATION ON CARRIER MOBILITY OF N- AND P-TYPE SILICON SUBSTRATES FOR SOLAR CELL APPLICATION

Naoki Matsuda[1], Shuya Tategami[1], Kenjiro Takauchi[1], Tetsuo Ikari[1], Kensuke Nishioka[1], Atsuhiko Fukuyama[1]

[1] University of Miyazaki

3TuPo.127

CONTROL OF BACKGROUND CARRIER CONCENTRATION IN H-MBE GROWN GaInNAs THIN FILMS FOR 4-JUNCTION SOLAR CELLS

Yilun He[1], Naoya Miyashita[2], Yoshitaka Okada[1,2]

[1] School of Engineering, The University of Tokyo, [2] Research Center for Advanced Science and Technology (RCAST), The University of Tokyo

3TuPo.128

SINGLE DOMAIN GROWTH OF LAYERED In2Se3 ON Si(111) AS AN INTERMEDIATE BUFFER LAYER IN GaAs ON Si

Nobuaki Kojima[1)], Li Wang[1)], Yoshio Ohshita[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute

3TuPo.129

SURFACE REACTION PROCESS OF GE THIN FILM ON Si AND GaAs SUBSTRATE BY PULSED-JET EPITAXY APPARATUS

Masahiro Kawano[1)], Toshihiro Yamauchi[1)], Masato Ishikawa[2)], Hiroshi Sudo[2)], Hideaki Machida[2)], Yoshio Ohshita[3)], Hidetoshi Suzuki[1)]

[1)] University of Miyazaki, [2)] Gas-Phase Growth LTD., [3)] Toyota Technological Institute

3TuPo.130

MOVPE PREPARATION OF GaP TEMPLATE ON Si(100) WITH IN-SITU REFLECTANCE ANISOTROPY MONITORING: IMPACT OF REACTOR CONTAMINATION

Boram Kim[1)], Oliver Supplie[2)], Agnieszuka Pasazuk[2)], Thomas Hannappel[2)], Yoshiaki Nakano[1)], Masakazu Sugiyama[1)]

[1)] The University of Tokyo, [2)] Ilmenau University of Technology

3TuPo.131

INFLUENCE OF S/Se QUANTITY ON Cu2ZnSn(S, Se)4 THIN FILM SOLAR CELLS SYNTHESIZED VIA PRESSURED RAPID THERMAL ANNEALING PROCESS

HyeongHo Shin[1)], JinHyeok Kim[1)]

[1)] Optoelectronics Convergence Research Center, Department of Materials Science and Engineering, Chonnam national University

3TuPo.132

ENHANCED OPEN-CIRCUIT VOLTAGE IN INGAP SOLAR CELLS GROWN BY SOLID SOURCE MOLECULAR BEAM EPITAXY

Yuki Nagato[1,2)], Ryuji Oshima[2)], Takeyoshi Sugaya[2)], Yoshinobu Okano[1)]

[1)] Department of Informaiton Engineering, Tokyo City University, [2)] National Institute of Advanced Industrial Science and Technology

3TuPo.133

GAAS SINGLE JUNCTION CELLS ON SI SUBSTRATES FABRICATED BY SURFACE ACTIVATED BONDING AND ETCHING OF SACRIFICIAL LAYERS

Sanji Yoon[1)], Jianbo Liang[1)], Naoteru Shigekawa[1)]

[1)] Osaka City University

3TuPo.134

EFFECTS OF GE BUFFER LAYER PREPARED BY PULSE-JET EPITAXY ON CRYSTAL QUALITY OF GAAS FILM GROWN ON SI (001) SUBSTRATE

Hidetoshi Suzuki[1)], Toshihiro Yamauchi[1)], Omar Elleuch[2)], Yu-Cian Wang[2)], Nobuaki Kojima[2)], Yoshio Ohshita[2)], Masafumi Yamaguchi[2)]

[1)] University of Miyazaki, [2)] Toyota Technological Institute

Tuesday, November 14
16:00-18:00 Room7+8+9 Area4

4TuPo.135

PERFORMANCE RATING AND I-V MEASUREMENT (RTOS METHOD) OF EMERGING PV COMPARE BETWEEN INDOOR LIGHTING AND SOLAR SIMULATOR

Yean-San Long[1)], En-Yun Wang[1)], Teng-Chun Wu[1)], Hung-Sen Wu[1)], Chin Lien [1)]

[1)] Energy & Envir. Metrogy Div. Center for Measurement Standards, Industrial Technology Research Institute

4TuPo.136

INVERTED POLYMER SOLAR CELLS WITH METAL-DOPED ZINC OXIDE AS AN ELECTRON EXTRACTION LAYER

Jun Young Kim[1)], Changhee Lee[2)]

[1)] Precision Manufacturing and Control Group, Korea Institute of Industrial Technology, [2)] Seoul National University

4TuPo.137

THE CHARGE STATE OF TITANIUM IN TITANIUM DIOXIDE: Ti4+ IS NOT A TENABLE CONCEPT

Sergei Manzhos[1)], Daniel Koch[1)]

[1)] Department of Mechanical Engineering, National University of Singapore

4TuPo.138

SUPPRESSION OF DETRIMENTAL REACTION OF P-TYPE CUI WITH ADDITIVE ORGANIC SALTS IN SOLID-STATE DYE-SENSITIZED SOLAR CELLS

Masahito Shiozawa[1)], Naohiko Kato[1)], Shinya Moribe[1)], Kazuo Higuchi[1)], Akira Suzuki[2)], Katsuya Tsuchimoto[2)], Yuki Tabata[3)], Katsuyoshi Mizumoto[3)], Shouichi Doi[3)], Tatsuo Toyoda[3)], Ryo Suzuki[1)], Mareedu Sreenivasu[2)]

[1)] Energy Conversion Materials Lab., Toyota Central Research and Development Laboratories, [2)] AISIN Cosmos R&D Co., Ltd., [3)] AISIN SEIKI Co., Ltd.

4TuPo.139

EMERGING SOLAR CELLS ON-SITE TESTS IN MALTA

Brian Azzopardi[1,2], John Chirchop[1], Renata Mikalauskiene[1], Francesca Brunetti[3]

[1] MCAST Energy Research Group, Institute of Engineering and Transport, Malta College of Arts, Science and Technology (MCAST), [2] Brian Azzopardi & Associates, Malta, [3] University of Rome Tor Vergata

4TuPo.140

ELECTROSTATIC DEPOSITION OF TITANIUM DIOXIDE MESOSCOPIC LAYERS FOR HIGH-EFFICIENCY DYE-SENSITIZED SOLAR CELLS

Sergey S. Kozlov[1], Anna B. Nikolskaia[1], Marina F. Vildanova[1], Olga V. Alexeeva[1], Liudmila L. Larina[1,2]

[1] Institute of Biochemical Physics, Russian Academy of Sciences, [2] Department of Material Science and Engineering, Korea Advanced Institute of Science and Technology

4TuPo.141

INDOOR ZERO ENERGY PLANT FACTORY BY USING DSSC POWER

Der Ray Huang[1,2,3], Chen Ming Hsu[1,2], Wei Hsiang Chiang[1,2]

[1] Green Energy & Photonics Center, National Chiao Tung University, [2] College of Photonics, National Chiao Tung University, [3] Research Center for Applied Science, Academia Sinica

4TuPo.142

PROPERTIES OF DSSCS AT VERY LOW INTENSITY CONDITION

Der Ray Huang[1,2], Wei Hsiang Chiang[1,2], Yi An Chen[2], Chih Hung Tsai[3]

[1] Green Energy & Photonics Center, National Chiao Tung University, [2] Energy Technology Center, National Dong Hwa University, [3] Department of Opto-Electronics Engineering, National Dong Hwa University

4TuPo.143

INNOVATIVE SIMULATORS FOR VERY LOW LIGHT INTENSITY CONDITIONS

Der Ray Huang[1,2,3], Wei Hsiang Chiang[1,2]

[1] Green Energy & Photonics Center, National Chiao Tung University, [2] Energy Technology Center, National Dong Hwa University, [3] Research Center for Applied Science, Academia Sinica

4TuPo.144

ROLE OF TEMPERATURE AND GROWTH PERIOD IN SYNTHESIS OF HYDROTHERMALLY GROWN TIO2 NANORODS

Soosaimanickam Ananthakumar[1,2], Pelin Yilmaz[2], Xuan Li[2], Joe Briscoe[2], Ann Louise Anderson[2], Steve Dunn[2], Sridharan Moorthy Babu[1]

[1] Crystal Growth Centre, Anna University, [2] Queen Mary University of London

4TuPo.145

PHOTOVOLTAIC CHARACTERISTICS OF THE DYE-SENSITIZED SOLAR CELLS WITH DOPED ZNO PHOTOELECTRODES

Wei-Te Li[1], You-Sheng Wu[1], Ping-Yu Li[1], Horng-Show Koo[1], Mi Chen[2]

[1] Department of Electronic Engineering, Minghsin University of Sci. & Tech., [2] Dpt. of Chemical & Material Eng., Minghsin University of Sci. & Tech.

4TuPo.146

UNSYMMETRICAL SQUARAINE DYES INCORPORATING BENZODITHIOPHENEπ- SPACER WITH ALKYL CHAINS TO EXTEND CONJUGATION, CONTROL THE DYE ASSEMBLY ON TIO2 AND RETARD CHARGE RECOMBINATION

Rajesh Bisht[1,2], Munavvar Fairoos M. K.[1], Ambarish Kumar Singh[1,2], Jayaraj Nithyanandhan[1,2]

[1] Physical and Materials Chemistry, CSIR-National Chemical Laboratory, CSIR-Network of Institute for Solar Energy, [2] Academy of Scientific and Innovative Research (AcSIR)

4TuPo.147

DEGRADATION CHARACTERISTICS OF THE MGO-ZNO-BASED DYE-SENSIZTIED SOLAR CELLS

Yung-Lin Hsu[1], Bo-Yao Huang[1], Ping-Yu Li[1], Mi Chen[1], Horng-Show Koo[1]

[1] Minghsin University of Science and Technology

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INFLUENCE OF IN2O3-ZNO WORKING ELETRODES ON PHOTOELECTRONIC PROPERTIES OF THE DYE-SENSITIZED SOLAR CELLS

You-Sheng Wu[1], Wei-Te Li[1], Ping-Yu Li[1], Mi Chen[1], Horng-Show Koo[1]

[1] Minghsin University of Science and Technology

4TuPo.149

EFFECT OF CACO3-DOPED ZNO ON DEGRADATION CHARACTERIZATION OF THE DYE-SENSITIZED SOLAR CELLS

Bo-Yao Huang[1], Yung-Lin Hsu[1], Ping-Yu Li[1], Mi Chen[1], Horng-Show Koo[1]

[1] Minghsin University of Science and Technology

4TuPo.150

BIMOLECULAR RECOMBINATION AND FILL FACTOR IN CRYSTALLINE POLYMER SOLAR CELLS

Tomohiro Fukuhara[1)], Yasunari Tamai[1)], Itaru Osaka[2)], Hideo Ohkita[1)]

[1)] Department of Polymer Chemistry, Kyoto University, [2)] Hiroshima University

4TuPo.151

ORGANIC SOLAR CELLS WITH INTERFACIAL LAYER FORMED BY SPONTANEOUS PHASE SEPARATION

Tetsuo Soga[1)], Seiya Kato[1)], Shinya Kato[1)], Naoki Kishi[1)]

[1)] Nagoya Institute of Technology

Tuesday, November 14
16:00-18:00 Room7+8+9 Area5

5TuPo.152

ROLE OF POLAR SOLVENT IN THE SYNTHESIS OF PEROVSKITE CH(NH2)2PbIxBr3-x THIN FILMS BY TWO-STEP METHOD FOR THIN-FILM SOLAR CELLS

Hajime Shirai[1)], Ryo Ishikawa[1)], Takuya Miura[1)], Kotaro Takahashi[1)]

[1)] Graduate School of Science and Engineering, Saitama University

5TuPo.153

VARIATION OF OPTICAL ABSORPTION WITH CENTER CATION IN HYBRID PEROVSKITE SOLAR CELLS

Masato Kato[1)], Takemasa Fujiseki[1)], Tetsuhiko Miyadera[2)], Takeshi Sugita[2)], Shohei Fujimoto[1)], Masato Tamakoshi[1)], Masayuki Chikamatsu[2)], Hiroyuki Fujiwara[1)]

[1)] Department of Electrical, Electronic and Computer Engineering, Gifu University, [2)] Research Center of Photovoltaics, National Institute of Advanced Industrial Science and Technology

5TuPo.154

HIGHLY EFFICIENT PLANAR PEROVSKITE SOLAR CELLS VIA MIXED SOLVENT ENGINEERING

You-Hyun Seo[1)], Mi-Jeong Choi[1)], Se-Phin Cho[1)], Seok-Soon Kim[2)], Sung-Nam Kwon[1)], Seok-In Na[1)]

[1)] Department of Flexible and Printable Electronics, Chonbuk National University, [2)] Kunsan National University

5TuPo.155

NICKEL OXIDE AS HOLE TRANSPORT LAYER IN LEAD IODIDE PEROVSKITE SOLAR CELLS

Masatoshi Yanagida[1)], Md Bodiul Islam[2)], Namrata Pant[2)], Yasuhiro Shirai[1)], Kenjiro Miyano[1)]

[1)] Global Reserch Center for Environment and Energy based on Nanomaterials Science (GREEN), National Institute for Materials Science (NIMS), [2)] Yamanashi University

5TuPo.156

THE RATIONALE OF HIGH EFFICIENCY OF PbI64--BASED PEROVSKITE SOLAR CELLS

Shozo Yanagida[1)], Susumu Yanagisawa[2)], Masatoshi Yanagida[3)], Hiroshi Segawa[4)]

[1)] Osaka University, [2)] University of the Ryukyus, [3)] National Institute for Materials Science, Japan, [4)] The University of Tokyo

5TuPo.157

ELECTRONIC STRUCTURES AND MAGNETIC PROPERTIES OF TRANSITION METAL DOPED PEROVSKITE COMPOUNDS FOR SOLAR CELL APPLICATIONS

Atsushi Suzuki[1)], Takeo Oku[1)]

[1)] Department of Materials Science, The University of Shiga Prefecture

5TuPo.158

EFFECTS OF C60, C70 PACKING AND THERMAL VIBRATIONS ON OPTICAL PROPERTIES AND BAND ALIGNMENT IN PLANAR PEROVSKITE SOLAR CELLS

Sergei Manzhos[1)], Saeid Arabnejad[2)], Amrita Pal[1)], Koichi Yamashita[2)]

[1)] Department of Mechanical Engineering, National University of Singapore, [2)] University of Tokyo

5TuPo.159

FABRICATION AND CHARACTERIZATION OF PEROVSKITE SOLAR CELLS DOPED WITH METAL ELEMENTS

Atsushi Suzuki[1)], Takeo Oku[1)], Masaya Taguchi[1)], Masataka Kato[1)], Hiroki Okumura[1)]

[1)] Department of Materials Science, The University of Shiga Prefecture

5TuPo.160

CRYSTAL STRUCTURE ANALYSIS OF PEROVSKITE CH3NH3PBI3 SOLAR CELLS BASED ON RIETVELD REFINEMENT

Yuji Ando[1)], Takeo Oku[1)]

[1)] Department of Materials Science, The University of Shiga Prefecture

5TuPo.161

A STUDY ON OPTICAL ABSORPTION SPECTRA OF PEROVSKITE THIN FILMS FOR DEFECT ESTIMATION BY PHOTOTHERMAL BENDING SPECTROSCOPY

Yuta Hirota[1)], Hiroki kato[2)], Kouta Kawahara[3)], Norimitsu Yosihda[3,4)], Shuichi Nonomura[3,4)]

[1)] Department of Energy Engineering, Graduate School of Natural Science and Technology, Gifu University, [2)] Environmental and Renewable Energy Systems Division,Graduate School of Engineering, Gifu University, [3)] Deparment of Electrial, Erectronic and Computer

Engineering, Faculty of Engineering, Gifu University, [4] Next Ganeration Energy Reserch Center, Gifu University

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UNRAVELING THE ROLE OF THE DROPPING TIME OF THE WASHING SOLVENT FOR THE FORMATION OF PEROVSKITE THIN FILMS AND THEIR APPLICATION IN PHOTOVOLTAICS

Sheng-De Wong[1], Wei-Chen Huang[1], Sheng-Hui Chen[1], Sheng Hsiung Chang[1]

[1] National Central University

5TuPo.164

DEVELOPMENT OF PEROVSKITE SOLAR CELLS WITH GRAPHENE LAYER AS HOLE TRANSPORT LAYER

Sho Watanabe[1], Ryousuke Ishikawa[1], Takahiro Nomoto[1], Nozomu Tsuboi[1]

[1] Materials Science Program, Niigata University

5TuPo.165

Strategies for high quality perovskite film realization in two-step fabrication process

Yi Ding[1,2,3,4], Lin Fan[1,2,3,4], Xin Yao[1,2,3,4], Biao Shi[1,2,3,4], Shijie Zhu[1,2,3,4], Cuicui Zheng[1,2,3,4], Ying Zhao[1,2,3,4], Xiaodan Zhang[1,2,3,4]

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STABILITY OF MIXED PEROVSKITE SOLAR CELLS: EFFECT OF OXYGEN, HUMIDITY AND TEMPERATURE AT 1 SUN

Said Kazaoui[1], Takurou N. Murakami[1], Nobuko Onozawa-Komatsuzaki[1], Takashi Funaki[1]

[1] Research Center for Photovoltaics (RCPV), National Institute of Advanced Industrial Science and Technology (AIST)

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EFFECTS OF METAL IONS SUBSTITUTION ON CH3NH3PBI3-BASED PEROVSKITES

Hiroki Tanaka[1], Yuya Ohishi[1], Takeo Oku[1]

[1] Department of Materials Science, The University of Shiga Prefecture

5TuPo.168

STRUCTURAL STABILITIES OF PEROVSKITE CRYSTALS FOR SOLAR CELLS

Hiroki Tanaka[1], Naoki Ueoka[1], Takeo Oku[1]

[1] Department of Materials Science, The University of Shiga Prefecture

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IMPACT OF AZAAROMATIC COMPOUNDS TREATMENT ON THE INTERFACE BETWEEN PEROVSKITE AND HOLE TRANSPORT MATERIAL IN PEROVSKITE SOLAR CELLS

Nobuko Onozawa-Komatsuzaki[1], Takurou N. Murakami[1], Takashi Funaki[1], Said Kazaoui[1], Masayuki Chikamatsu[1], Wei-Wei Wang[2,3], Manabu Sugimoto[2,3]

[1] National Institute of Advanced Industrial Science and Technology (AIST), [2] Kumamoto University, [3] The University of Tokyo

5TuPo.170

CESIUM ION DOPED NICKEL OXIDE LAYERS FOR INVERTED PEROVSKITE SOLAR CELLS

Shota Fukumoto[1], Naoyuki Shibayama[1], Hiroyuki Kanda[1], Ajay Kumar Baranwal[1], Yuichi Haruyama[1], Hiroshi Segawa[2], Tsutomu Miyasaka[3], Seigo Ito[1]

[1] University of Hyogo, [2] University of Tokyo, [3] Toin University of Yokohama

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LOW RESISTIVITY AND FLAT SURFACE OF FTO THIN FILM BY SPRAY PYROLYSIS

Kenji Yoshino[1,5], Manato Takeuchi[1], Yuhei Ogomi[2,5], Takashi Minemoto[3,5], Qing Shen[4,5], Taro Toyoda[4,5], Shuzi Hayase[2,5]

[1] University of Miyazaki, [2] Kyushu Institute of Technology, [3] Ritsumeikan University, [4] University of Electro-Communications, [5] JST-CREST

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ELECTRON TRANSPORT OF BAND OFFSET OF BUFFER LAYER FOR PEROVSKITE BASED SOLAR CELL

Kenji Yoshino[1,5], Himeka Tominaga[1], Yuhei Ogomi[2,5], Takashi Minemoto[3,5], Qing Shen[4,5], Taro Toyoda[4,5], Shuzi Hayase[2,5]

[1] University of Miyazaki, [2] Kyushu Institute of Technology, [3] Ritsumeikan University, [4] University of Electro-Communications, [5] JST-CREST

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PLANAR PEROVSKITE SOLAR CELLS PREPARED USING SHEAR COATING PROCESS

Ji-Hye Choe[1], Ji-Ho Song[1], Ji-Young Jeong[1], Choong-Heui Chung[1], Ki-Ha Hong[1]

[1)] Department of Materials Science and Engineering, Hanbat National University

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Enhanced UV Stability and Open Circuit Voltage of Perovskite Solar Cells with SrO Interlayer

Sang-Won Lee[1)], Seongtak Kim[1)], Soohyun Bae[1)], Kyungjin Cho[1)], Taewon Chung[1)], Inseol Song[2)], Sungeun Park[1)], Hae-Seok Lee[2)], Yoonmook Kang[2)], Donghwan Kim[1)], Jae-Keun Hwang[1)], Seunghun Lee[1)], Yoon Jung Lee[1)], Yeon Li Moon[1)]

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MIXED PEROVSKITE SOLAR CELLS WITH DOUBLED METAL CATIONS

Chie Gau[1)], Yan-Hao Chen[1)], I-Hsiu Gau[2)], Peter Chen[3)]

[1)] Institute of Aeronautics and Astronautics/Research Center for Energy Technology and Strategy, National Cheng Kung University, [2)] Department of Electronic Engineering, National Kaohsiung Normal University, [3)] Department of Photonics, National Cheng Kung University

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MICROWAVE-ASSISTED SYNTHESIS OF SnO2 AS CHARGE EXTRACTION LAYER FOR PEROVSKITE SOLAR CELLS

Chie Gau[1)], Wei Ting Xu[1)], I-Hsiu Gau[2)], Peter Chen[3)]

[1)] Institute of Aeronautics and Astronautics/Research Center for Energy Technology and Strategy, National Cheng Kung University, [2)] Department of Electronics Engineering, National Kaohsiung Normal University, [3)] Department of Photonics, National Cheng Kung University

5TuPo.178

PRECUSOR AGING EFFECT ON METHYLAMMONIUM LEAD AND TIN IODIDE FILMS

Sridharan Moorthy Babu[1)], G. Mano Balaji[1)], M. Pandiyarajan[1)], Subashchandran Shanthi[1)]

[1)] Crystal Growth Centre, Anna University

5TuPo.179

EFFECT OF FERROELECTRIC POLARIZATION ON BAND CONDUCTION: POSSIBLE ORIGIN OF I-V CURVE HYSTERESIS IN PEROVSKITE SOLAR CELLS

Yasutake Toyoshima[1)]

[1)] Research Institute for Energy Conservation, National Institute of Advanced Industrial Science and Technology

5TuPo.180

STUDY ON SPACE APPLICATION OF PEROVSKITE SOLAR CELLS

Olga Malinkiewicz[1)], Mitsuru Imaizumi[2)], Takeshi Ohshima[3)]

[1)] CTO Saule Technologies, Wroclaw, [2)] Japan Aerospace Exploration Agency (JAXA), [3)] National Institutes for Quantum and Radiological Science and Technology (QST)

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LIGHT INCOUPLING ENHANCEMENT IN PEROVSKITE SOLAR CELL USING NANO-STRUCTURED TRANSPARENT CONTACT

Mohammad I. Hossain[1,2)], Wayesh Qarony[1)], Xin-Hua Zhao[1)], F. K. Palash[2)], C. Sarkar[2)], R. Islam[2)], M. Shamsuddin[2)], Yuen Hong Tsang[1)]

[1)]Department of Applied Physics, The Hong Kong Polytechnic University, [2)]Department of EEE, American International University Bangladesh (AIUB)

Tuesday, November 14
16:00-18:00 Room7+8+9 Area6

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Rare earth doped up conversion nanophosphor material for solar cell application

Vinod Kumar[1)], O.M. Ntwaeaborwa[2)], H.C. Swart[3)], Viresh Dutta[1)]

[1)] Centre for Energy Studies, Indian Institute of Technology Delhi, [2)] School of Physics, University of the Witwatersrand, [3)] Department of Physics, University of the Free State

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AB INITIO CALCULATION OF TRANSPORT PROPERTIES BETWEEN PBSE QUANTUM DOTS FACETS WITH HALIDE LIGANDS (CL, BR, I)

Bo Wang[1)], Robert Patterson[1)], Sujuan Huang[1)], Santosh Shrestha[1)], Gavin Conibeer[1)]

[1)]Australian Centre for Advanced Photovoltaics, School of Photovoltaics and Renewable Energy Engineering, University of New South Wales

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SPACER BARRIER EFFECT ON InGaAs QUANTUM DOTS SOLAR CELLS

Tsong-Sheng Lay[1)], Z. H. Lin[1)]

[1)] Department of Electrical Engineering and Graduate Institute of Optoelectronic Engineering, National Chung Hsing University

6TuPo.184

SELECTIVELY PROBING SURFACE AND BULK CARRIER DYNAMICS IN SEMICONDUCTORS VIA TWO-PHOTON

PHOTOLUMINESCENCE

Robert Lee Chin[1)], Michael Pollard[1)], Thorsten Trupke[1)], Ziv Hameiri[1)]

[1)] Photovaltaics and Renewable Energy Engineering, University of New South Wales

6TuPo.185

PHOTOELECTRIC CONVERSION IN A LIMITED LENGTH FROM THE END OF OPTCAL FIBER TRANSMITTING OUTPUT OF SOLAR PUMPED LASERS BY RELIEVING OPTICAL CONFINEMENT CONDITION OF OPTICAL FIBER AND SURROUNDING AND ENCLOSING IT WITH PHOTOVOLTAIC LAYERS

Satoshi Takimoto[1)], Kazuo Higuchi[1,2)], Kemmei Watanabe[1)], Hidetaka Terazawa[1)], Kazuo Hasegawa[2)], Tadashi Ichikawa[2)], Hiroshi Ito[1)], Akihisa Ichiki[1)], Yasuhiko Takeda[2)], Tomoyoshi Motohiro[1,2)], Takaya Kato[1)], Yasuhiro Suzuki[1)], Shintaro Mizuno[2)]

[1)] Graduate School of Engineering, Nagoya University, [2)] Toyota Central Research and Development Laboratories, Inc.

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HIVE-SUPER-TYPE SOLAR BOX FOR MONOCHROMATIC PHOTOELECTRIC CONVERSION IN AN INDOOR CONTROLLED AMBIENT CONDITIONS USING A LASER LIGHT TRANSMITTED VIA OPTICAL FIBER FROM SOLAR PUMPED LASERS LOCATED AT A DISTANT PLACE OUTDOORS

Kemmei Watanabe[1)], Satoshi Takimoto[1)], Takaya Kato[1)], Hidetaka Terazawa[1)], Yasuhiro Suzuki[1)], Hiroshi Ito[1)], Akihisa Ichiki[1)], Yasuhiko Takeda[2)], Kazuo Higuchi[1,2)], Tomoyoshi Motohiro[1,2)], Kazyo Hasegawa[2)], Shintaro Mizuno[2)], Tadashi Ichikawa[2)]

[1)] Graduate School of Engineering, Nagoya University, [2)] Toyata Central Research and Development Laboratories, Inc.

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IMPROVEMENT OF MODE-MATCHING EFFICIENCY OF SOLAR PUMPED LASERS FOR MONOCHROMATIC PHOTOELECTRIC CONVERSION

Takaya Kato[1)], Kemmei Watanabe[1)], Hidetaka Terazawa[1)], Akio Ikesue[1)], Kazuo Hasegawa[2)], Shintaro Mizuno[2)], Tadashi Ichikawa[2)], Hiroshi Ito[1)], Yasuhiko Takeda[2)], Tomoyoshi Motohiro[1,2)], Satoshi Takimoto[1)], Yasuhiro Suzuki[1)], Akihisa Ichiki[1)]

[1)] Graduate School of Engineering, Nagoya University, [2)] Toyota Central Research and Development Laboratories, Inc.

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FABRICATION OF TUNABLE BANDGAP FEW-LAYER MOS2 FILMS AND THEIR EMERGING APPLICATION IN TANDEM CELLS

Xiao-Mei Zhang[1,2)], Ming-Yen Lu[4)], Manabu Ihara[2,3)]

[1)] Department of Mechanical Engineering, Tokyo Institute of Technology, [2)] Department of Chemical Science and Engineering,Tokyo Institute of Technology, [3)] Department of Chemistry, Tokyo Institute of Technology, [4)] Department of Materials Science and Engineering, National Tsing Hua University

6TuPo.189

LIGHT-TRAPPING FOR CRYSTALLINE SILICON PHOTOVOLTAIC CELLS USED FOR REMOTE POWER SUPPLY FROM SOLAR-PUMPED LASERS

Yasuhiko Takeda[1)], Tadashi Ito[1)], Noboru Yamada[1)], Kazuo Hasegawa[1)], Shintaro Mizuno[1)], Tadashi Ichikawa[1)], Luitel H. Nath[1)], Hideo Iizuka[1)], Kazuo Higuchi[1,2)], Hiroshi Ito[2)], Akihisa Ichiki[2)], Tomoyoshi Motohiro[2)]

[1)] Toyota Central Research and Development Laboratories, Inc., [2)] Nagoya University

6TuPo.190

TAILORING SURFACE MORPHOLOGY AND THERMAL STABILITY OF HIGHLY CONDUCTIVE SILVER NANOWIRE TRANSPARENT ELECTRODES BY ELECTRODEPOSITION

Choong-Heui Chung[1)], Jiseong Jang[1)], KyungSoo Cho[1)], Ki-Ha Hong[1)]

[1)] Department of Materials Science and Engineering, Hanbat National University

6TuPo.191

DESIGN AND ANALYSIS OF TRANSPARENT SOLAR WINDOW SYSTEM USING FRESNEL LENS AND WAVEGUIDE GLASS

Ganghoo Lee[1)], Myunghun Shin[1)], Seunghyun Yoon[1)], Jeonghoo Jo[1)], Sungryoung Koo[1)]

[1)] Korea Aerospace University

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Fabrication of n-type Epitaxial Germanium Films on Silicon Wafer with Sb/Ge Alloy Target by Sputtering Deposition

Sheng-Hui Chen[1)], Sheng-Wen Chen[1)], Cheng-Wei Luo[1)], Shao-Ze Tseng[1)], Chao-Yang Tsao[1,2)]

[1)] Department of Optics and Photonics, National Central University, [2)] Taiwan Power Company

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GROWTH OF TYPE II GERMANIUM CLATHRATE ON SAPPHIRE SUBSTRATES

Nanto Sugii[1)], Fumitaka Ohashi[1)], Tetsuji Kume[1)], Himanshu Shekhar Jha[1)], Tetsuya Mukai[1)], Hideya Makino[1)], Kansei Suzuki[1)], Shuichi Nonomura[1)]

[1)] Gifu University

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GROWTH AND CHARACTERIZATION OF ZnCdO THIN FILMS BY MOLECULAR BEAM EPITAXY FOR TRANSPARENT CONDUCTIVE OXIDES

Hyo Chang Jang[1)], Syohei Ushio[1)], Shuji Tsutsumi[1)], Tooru Tanaka[1)], Katsuhiko Saito[1)], Qixin Guo[1)], Kin Man Yu[2)], Wladek Walukiewicz[3,4)]

[1)] Saga University, [2)] City University of Hong Kong, [3)] Lawrence Berkeley National Laboratory, [4)] University of California at Berkeley

6TuPo.195

STRUCTURAL AND OPTICAL PROPERTIES OF Cu2ZnSnS4:Cr FOR INTERMEDIATE BAND SOLAR CELLS BY CO-SPUTTERING TECHNIQUE

Nowshad Amin[1,2)], Megat M. Izhar Sapeli[1,3)], Seyed A. Shahahmadi[2)], Puvaneswaran Chelvanathan[2)], Md. Akhtaruzzaman[2)]

[1)] Department of Electrical, Electronic and System Engineering, The National University of Malaysia, [2)] Solar Energy Research Institute (SERI), The National University of Malaysia, [3)] Universiti Teknologi MARA

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PHYSICAL CHARACTERIZATION OF THE DYE-SENSIZTIED SOLAR CELLS WITH FE2O3-DOPED ZNO PHOTO-ANODE ELECTRODES

Pin-Yea Chen[1)], Wei-Te Li[1)], Horng-Show Koo[1)]

[1)] Department of Electronic Engineering, Minghsin University of Science and Technology

6TuPo.197

INFLUENCE OF GA2O3-DOPED ZNO FILMS ON PHYSICAL CHARACTERIZATION OF THE DYE-SENSITIZED SOLAR CELLS

Cheng-Hsien Tsai[1)], Wei-Te Li[1)], Horng-Show Koo[1)]

[1)] Department of Electronic Engineering, Minghsin University of Science and Technology

6TuPo.198

FABRICATION AND CHARACTERIZATION OF CUSBSE2 THIN FILMS BY SELENIZATION OF METAL PRECURSORS

Shunichi Tsuji[1)], Yusuke Kato[1)], Tooru Tanaka[1)], Katsuhiko Saito[1)], Qixin Guo[1)]

[1)] Department of Electrical and Electronic Engineering, Saga University

6TuPo.199

EFFECT OF NON-PHOSPHINE SOLVENTS ON THE STRUCTURE and MORPHOLOGY OF THE Cu2SnSe3 (CTSe) NANOPARTICLES SYNTHESIZED BY HOT-INJECTION METHOD

Sridharan Moorthy Babu[1)], Soosaimanickam Ananthakumar[1)]

[1)] Crystal Growth Centre, Anna University

6TuPo.200

CRYSTALLINE SILICON PHOTOVOLTAIC CELLS USED FOR POWER TRANSMISSION FROM SOLAR-PUMPED LASERS: PRACTICAL IMPLEMENTATIONS

Yasuhiko Takeda[1)], Noboru Yamada[1)], Tadashi Ito[1)], Hiroshi Ito[2)], Tomoyoshi Motohiro[2)]

[1)] Toyota Central Research and Development Laboratories, Inc., [2)] Nagoya University

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CONTINUOUS OSCILLATION OF A SOLAR-PUMPED LASER FROM 10:50AM TO 17:33PM

Yasuhiro Suzuki[1)], Hiroshi Itoh[1)], Takaya Kato[4)], Luu Thi An Phuc[2)], Kemmei Watanabe[4)], Hidetaka Terazawa[4)], Kazuo Hasegawa[3)], Akio Ikesue[1)], Yasuhiko Takeda[3)], Tomoyoshi Motohiro[1,3,4)], Tadashi Ichikawa[3)], Shintaro Mizuno[3)], Akihisa Ichiki[1)], Satoshi Takimoto[4)]

[1)] Green Mobility Research Institute, Institutes of Innovation for Future Society, Nagoya University, [2)] Hanoi University of Science and Technology, [3)] Toyota Central R&D Labs.,Inc., [4)] Graduate School of Engineering, Nagoya University

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PROPORTION OF OPTCIAL TRANSITION ON CARRIER EXTRACITON FROM GaSb QUANTUM NANOSTRUCTURES

Yasushi Shoji[1)], Ryo Tamaki[1)], Yoshitaka Okada[1)]

[1)] Research Center for Advanced Science and Technology, The University of Tokyo

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FABRICATION OF (Mn,Fe)Siγ~1.7 THIN FILMS FOR NEAR-INFRARED ABSORPTION SOLAR CELLS

Kei Hayashi[1)], Kentaro Ishii[1)], Chihiro Kawasaki[2)], Ryosuke Honda[2)], Yuzuru Miyazaki[1)]

[1)] Department of Applied Physics, Graduate School of Engineering Tohoku University, [2)] School of Engineering, Tohoku University

Tuesday, November 14
16:00-18:00 Room7+8+9 Area7

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ESTABLISHMENT OF AN EMPIRICAL COEFFICIENT REPRESENTS THE IMPACT OF DUST ON SHORT CIRCUIT CURRENT FOR A MONO-CRYSTALLINE PV PANEL UNDER SPARSE ENVIRONMENTAL CONDITIONS

Abubaker A. Younis[1)], Yosif M. AlHorr[1)], Esam O. Elsarrag[1)], Mahmoud M. Onsa[2)]

[1] Gulf Organization for Research and Development, [2] University of Khartoum

7TuPo.205

PHOTOVOLTAIC SOILING AND MITIGATION BY ELECTRODYNAMIC DUST SHIELD

Bing Guo[1], Wasim Javed[1], Benjamin Figgis[2,3,4], Yiming Wubulikasimu[1]

[1] Texas A&M, University at Qatar, [2] Qatar Environment and Energy Research Institute, [4] Université de Strasbourg - CNRS

7TuPo.206

RELIABILITY INVESTIGATION OF FIVE PV TECHNOLOGIES UNDER ACTUAL OPERATING CONDITIONS FOR SIX YEARS

Tetsuyuki Ishii[1], Sungwoo Choi[2], Ritsuko Sato[2], Yasuo Chiba[2], Atsushi Masuda[2]

[1] Materials Science Research Laboratory, Central Research Institute of Electric Power Industry, [2] National Institute of Advanced Industrial Science and Technology

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PRECISE SHORT CIRCUIT CURRENT CORRECTION OF THIN-FILM PHOTOVOLTAIC MODULES USING SPECTRAL INDEX

Yuhei Horio[1], Yurie Imai[1], Masaki Tsuji[1], Md. Mijanur Rahman[1], Yoshihiro Hishikawa[2], Takashi Minemoto[1]

[1] Department of Advanced Electrical, Electronic and Computer Systems, Ritsumeikan University, [2] National Institute of Advanced Industrial Science and Technology

7TuPo.208

ACCURATE VOLTAGE MEASUREMENT OF SOLAR CELLS IN MODULE STRUCTURE USING A NON-CONTACTING ELECTROSTATIC VOLTMETER

Sakutaro Miyajima[1], Yasuyuki Ota[1], Yoshihiro Hishikawa[2], Kensuke Nishioka[1]

[1] Department of Applied Physics and Electronic Engineering, Miyazaki University, [2] National Institute of Advanced Industrial Science Technology (AIST)

7TuPo.209

PERFORMANCE ANALYSIS OF FIELD EXPOSED MULTI-CRYSTALLINE MODULES OVER 30 YEARS

Kai Zhang[1,2], Wei hong Huang[1], Huili Han[2], Huan Yan[2], Hui Shen[2], Xian Dong[1]

[1] Shun De SYSU Institute for Solar Energy, [2] Sun Yat-Sen University

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ANALYSIS OF TEMPORAL CHANGE IN OUTDOOR PHOTOVOLTAIC PERFORMANCE USING THE CORRECTED SHORT CIRCUIT CURRENT

Yurie Imai[1], Yuhei Horio[1], Masaki Tsuji[1], Rahman Md. Mijanur[1], Yoshihiro Hishikawa[2], Takashi Minemoto[1]

[1] Ritsumeikan University, [2] National Institute of Advanced Industrial Science and Techonology

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DEGRADATION AND SEASONAL EFFECTS OF AMORPHOUS SILICON MODULES DUE TO OUTDOOR EXPOSURE BY INDOOR AND OUTDOOR MEASUREMENTS

Sungwoo Choi[1], Ritsuko Sato[1], Tetsuyuki Ishii[2], Yasuo Chiba[1], Atsushi Masuda[1]

[1] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology, [2] Central Research Institute of Electric Power Industry

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PROCEDURES FOR PRECISE AND HIGHLY EFFICIENT OUTDOOR PERFORMANCE- MEASUREMENT OF PHOTOVOLTAIC MODULES

Kohji Masuda[1], Tadashi Obayashi[1], Yoshihiro Hishikawa[2]

[1] Japan Electrical Safety & Environment Technology Laboratories, [2] National Institute of Advanced Industrial Science and Technology (AIST)

7TuPo.214

TEMPERATURE DISTRIBUTION IN PHOTOVOLTAIC MODULE OPERATING IN REAL ENVIRONMENTAL CONDITIONS

Kazuki Okumoto[1], Kensuke Nishioka[1]

[1] Miyazaki University

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SOILING BY VOLCANIC ASH FALL ON PHOTOVOLTAIC MODULES AND EFFECTS BY HYDROPHILIC COATING ON MODULE COVER GLA SS

Tadashi Hirayama[1], Shota Saiki[1], Shuma Kawabata[1], Akihito Hirai[2], Yukio Yoshimura[3], Chizuko Yamamoto[4], Atsushi Masuda[4]

[1] Kagoshima University, [2] Central Automotive Products, [3] Kagoshima Prefectural Institute of Industrial Technology, [4] National Institute of Advanced Industrial Science and Technology

7TuPo.216

SHADING EFFECT IN PERFOMANCE EVALUATIONS OF CRYSTALLINE SILICON BARE CELLS

Haruya Shimura[1], Masahiro Yoshita[1], Yoshihiro Hishikawa[1]

[1] National Institute of Advanced Industrial Science and Technology (AIST)

7TuPo.217

Damages of PV Modules Detected By Using UAV Equipped With Thermal Imaging Camera

Der Ray Huang[1,2], Yu Jen Chen[1], Guo Zua Wu[3]

[1] Green Energy & Photonics Center, National Chiao Tung University, [2] Research Center for Applied Science, Academia Sinica, [3] Bio-IT Tech Division, Biomedical Technology & Device Research Center, ITRI

7TuPo.218

TEMPERATURE DEPENDENCE AND PERFORMANCE ANALYSIS OF PHOTOVOLTAIC MODULES

Jaffar Abdu[1], Shigeomi Hara[1], Sungwoo Choi[2], Yasuo Chiba[2], Atsushi Masuda[2], Makoto Kasu[1]

[1] Department of Electrical and Electronic Engineering, Saga University, [2] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

7TuPo.219

SHORT-PERIOD FLUCTUATIONS OF SOLAR IRRADIANCE AND CLOUD CONDITIONS

Zhang Junfang[1], Kota Watanabe[1], Jun Yoshino[1], Tomonao Kobayashi[1]

[1] Gifu University

7TuPo.220

SOLAR IRRADIANCE ENHANCEMENT DUE TO CLOUD EDGE EFFECT

Zhang Junfang[1], Kota Watanabe[1], Jun Yoshino[1], Tomonao Kobayashi[1]

[1] Gifu University

7TuPo.221

SHORT TIME AND SPACE VARIATIONS OF SOLAR IRRADIANCE UNDER CLOUDS

Zhang Junfang[1], Kota Watanabe[1], Jun Yoshino[1], Tomonao Kobayashi[1], Yoshihiro Hishikawa[2], Takuya Doi[2]

[1] Gifu University, [2] National Institute of Advanced Industrial Science and Technology

7TuPo.222

THE OPERATING MODULE TEMPERATURE OF PV POWER PLANT IN THAILAND

Tanokkorn Chenvidhya[1], Manit Seapan[1], Wilawan Seakaew[1], Ballung Muenpinij[1], Dhirayut Chenvidhya[1], Krissanapong Kirtikara[1]

[1] CES Solar Cells Testing Center, Pilot Plant Development and Training Institute, King Mongkut's University of Technology Thonburi

7TuPo.223

STATISTICAL ANALYSIS OF AGING CHARACTERISTICS OF PV MODULE OUTPUT USING LINEAR INTERPOLATION METHOD

Takatoshi Kawase[1], Yuzuru Ueda[1]

[1] Department of Electrical Engineering, Tokyo University of Science

7TuPo.224

VALIDATION OF MEASUREMENT PROTOCOLS APPLICABLE TO PERFORMANCE CHARACTERIZATION OF VARIOUS EMERGING SOLAR CELLS

Masahiro Yoshita[1], Ayumi Sasaki[1], Takashi Ueda[1], Haruya Shimura[1], Yoshihiro Hishikawa[1]

[1] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

7TuPo.225

QUANTIFYING AND ANALYSING THE VARIABILITY OF PV MODULE RESISTANCES RSC AND ROC TO UNDERSTAND AND OPTIMISE KWH/KWP MODELLING

Steven J. Ransome[1], Juergen Sutterlueti[2]

[1] Steve Ransome Consulting Ltd., [2] Gantner Instruments Environment Solutions Germany

7TuPo.226

HIGH EFFICIENT AND STABLE LARGE-AREA ORGANIC SOLAR CELLS BY BLADE COATING

Kuan-Min Huang[1], Hsin-Fei Meng[1], Hsiao-Wen Zan[1]

[1] Department of Photonics, National Chiao Tung University, [2] Institute of Physics, National Chiao Tung University

7TuPo.227

FAST TENPORAL RESPONSES OF SPECTRAL RESPONSIVITIES IN EMERGING PEROVSKITE SOLAR CELLS

Masahiro Yoshita[1], Ayumi Sasaki[1], Takashi Ueda[1], Haruya Shimura[1], Yoshihiro Hishikawa[1]

[1] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

7TuPo.228

PERFORMACE CHANGE OF PHOTOVOLTAIC MODULES FOR 10 YEARS OUTDOOR EXPOSURE TEST IN TSUKUBA, JAPAN

Takumi Takashima[1]

[1] Research Center for Photovoltaics, National Institute of Advanced

Industrial Science and Technology (AIST)

7TuPo.229

CONSIDERATION OF TEMPERATURE CORRECTION OF OPEN CIRCUIT VOLTAGE CALCULATED FROM EL INTENSITY FOR OUTDOOR MEASUREMENT

Daisuke Kobayashi[1)], Takuya Oshima[1)], Kazuki Noguchi[1)], Yasuaki Ishikawa[1)], Yukiharu Uraoka[1)]

[1)] Graduate School of Materials Science, Nara Institute of Science and Technology

7TuPo.230

DEGRADATION ANALYSIS OF THE ENCAPSULANT MADE OF ETHYLENE VINYL ACETATE IN CRYSTALLINE SILICON PHOTOVOLTAIC MODULES USING POSITRON ANNIHILATION LIFETIME SPECTROSCOPY

Hideaki Hagihara[1)], Hiroaki Sato[1)], Yukiko Hara[2)], Sachiko Jonai[2)], Atsushi Masuda[2)]

[1)] Research Institute for Sustainable Chemistry, National Institute of Advanced Industrial Science and Technology (AIST), [2)] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology (AIST)

7TuPo.231

COMPARISON OF SOILING ON TILTED AND VERTICAL PHOTOVOLTAICS

Ryota Sakamoto[1)], Kensuke Nishioka[1)]

[1)] Graduate School of Engineering, Miyazaki University

7TuPo.232

RELIABILITY AND LONG TERM DURABILITY OF BIFACIAL PHOTOVOLTAIC MODULES USING TRANSPARENT BACKSHEET

Keita Arihara[1)], Ryosuke Koyoshi[1)], Yasuhiro Ishii[1)], Masaru Kadowaki[1)], Atsushi Nakahara[1)], Hitoshi Nishikawa[1)], Kinichi Ogawa[2)], Yasuo Chiba[2)], Atsushi Masuda[2)]

[1)] High-performance Materials Operations, Dai Nippon Printing Co., Ltd., [2)] National Institute of Advanced Industrial Science and Technology

7TuPo.233

PERFORMANCE COMPARISON ON THE FLOATING PV SYSTEM AND PV ROOFTOP SYSTEMS

Wilawan Seekaew[1)], Tanokkorn Chenvidhya[1)], Manit Seapan[1)], Ballang Muenpinij[1)], Dhirayut Chenvidhya[1)], Krissanapong Kirtikara[1)]

[1)] CES Solar Cells Testing Center (CSSC), King Mongkut's University of Technology Thonburi (KMUTT)

Tuesday, November 14
16:00-18:00 Room7+8+9 **Area8**

8TuPo.234

POWER LOSS PHOTOVOLTAIC MODULE DETECTION METHOD BY TWO STEPS

Kazumi Takano[1)], Yusuke Toda[1)], Masaru Yamashita[1)], Katsuhiko Shirasawa[2)]

[1)] Product Development, ITES CO.,Ltd., [2)] National Institute of Advanced Industrial Science Technology

8TuPo.235

PERFORMANCE LOSS OF 5-YEAR-OLD GRID CONNECTED PHOTOVOLTAIC SYSTEM IN THAILAND

Amornrat Limmanee[1)], Sasiwimon Songtrai[1)], Nuttakarn Udomdachanut[1)], Songpakit Kaewniyompanit[2)], Yukinobu Sato[3)], Masaki Nakaishi[3)], Songkiate Kittisontirak[1)], Kobsak Sriprapha[1)], Yukitaka Sakamoto[3)]

[1)] Solar Energy Technology Lab., National Electronics and Computer Technology Center, National Science and Technology Development Agency, [2)] Thai Tabuchi Electric Co., Ltd., [3)] Tabuchi Electric Co., Ltd.

8TuPo.236

ENERGY MANAGEMENT WITH 7KWP PV SYSTEM AND IOT MONITORING AT SUKSASONGKROH CHIANG MAI SCHOOL

Worrajak Muangjai[1)], Wichan Jantee[1)], Wathanyu Wannaprom[1)]

[1)] College of Integrated Science and Technology, Rajamangala University of Technology Lanna

8TuPo.237

INVERTER SIZING FOR A GRID CONNECTED SOLAR PHOTOVOLTAIC POWER PLANT USING GROUND MEASURED SOLAR IRRADIANCE AND TEMPERATURE: ANALYSIS USING NEW SIMULATION APPROACH

NIKHIL Pattath GOPI[1)], CHANDAN BANERJEE[1)], SUDHIR KUMAR SINGH[1)], VIKRANT SHARMA[1)], RAHUL PACHAURI[1)]

[1)] SOLAR RESOURCE ASSESSMENT DIVISION, NATIONAL INSTITUTE OF SOLAR ENERGY

8TuPo.238

A SOLAR TRACKING SYSTEM WITH DOWNWARD-FACING STANDBY STATE FOR DRY AREAS

Kensuke Nishioka[1)], Shota Kurogi[1)], Yasuyuki Ota[1)], Jun Hirota[2)]

[1)] Research Center for Sustainable Energy & Environmental Engineering, University of Miyazaki, [2)] THK Co., Ltd.

8TuPo.239

DIFFERENT PYRANOMETERS TO EVALUATE 60 kW PV SYSTEM PERFORMANCE

Yasuhiro Matsumoto[1)], Jos Antonio Urbano[1)], Ramón Peña,[1)], Maria de la Luz Olvera[1)], Miguel A. Luna[1)], Mauricio Ortega[1)], René Asomoza[1)]

[1)] Electrical Engineering Centro de Investigación y de Estudios Avanzados del IPN, Polytechnic Institute

8TuPo.240

ENERGY YIELD PREDICTION OF MULTI-JUNCTION CELLS CONSIDERING ATOMOSPHERIC PAREMETERS FLUCTUATION USING MONTE CARLO METHODS

Kenji Araki[1)], Yasuyuki Ota[2)], Takumi Sakai[2)], Kan-Hua Lee[1)], Kensuke Nishioka[2)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute, [2)] University of Miyazaki

8TuPo.241

ALBEDO IMPROVEMENT AND WEED PROOF EFFECTS OF A WHITE FOAM GLASS MADE FROM WASTE GLASS

Reita Kawashima[1)], Takumi Sakai[1)], Yasuyuki Ota[1)], Kensuke Nishioka[1)]

[1)] Department of Engineering, Miyazaki University

8TuPo.242

SITE-SPECIFIC UNCERTAINTIES AND MODELING CONSIDERATIONS FOR ENERGY YIELD SIMULATION OF BIFACIAL PV SYSTEMS OPERATING IN NORDIC CLIMATE

Ioannis (John) A. Tsanakas[1)], Marcus Graefenhain[1)], Frank Fiedler[2)]

[1)] Solar Energy Department, Institute for Energy Technology (IFE), [2)] Dalarna University, European Solar Engineering School

8TuPo.243

PREDICTION SIMULATION USING COUPLED MODEL TEMPERATURE DISTRIBUTION ON PV CELL IN WHICH HOTSPOT HAS OCCURRED DUE TO PARTIAL SHADE

Daisuke Wagi[1)], Ikuo Nanno[1)]

[1)] Advanced Course of Production Systems Engineering, National Institute of Technology, Ube College

8TuPo.244

THE MEASUREMENT METHOD OF I-V CURVE USING AN ARRAY TESTER WITH CAPACITOR

Yu Na Park[1)], Gil Soo Jang[1)], Suk Whan Ko[2)], Gi Hwan Gang[2)], Jung Hun So[2)], Young Seok Jung[2)], Young Chul Ju[2)], Hye Mi Hwang[2)], Hyung Jun Song[2)]

[1)] Korea University, [2)] Korea Institute of Energy Research

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The Electrical and Thermal Characteristic of Photovoltaic module between under partial shading and with short failure bypasses diode

Suk-Whan Ko[1)], Young-Chul Ju[1)], Hyung-Jun Song[1)], Gi-HWan Kang[1)], Hye-Mi Hwang[1)], Jung-Hun So[1)], Young-Seok Jung[1)]

[1)] Photovoltaic Laboratory, Korea Institute of Energy Research

8TuPo.246

SEPARATION METHOD OF SNOW COVER LOSS WITH SV METHOD

Yuta Takeuchi[1)], Yuzuru Ueda[1)], Masaki Shioya[2)]

[1)] Tokyo University of Science, [2)] KAJIMA CORPORATION

8TuPo.247

DEVELOPMENT OF AUTOMATIC DEFECT DETECTION METHOD IN PHOTOVOLTAIC MODULES BY INFRARED IMAGE ANALYSIS

Kenji Kamiya[1)], Yuzuru Ueda[1)]

[1)] Tokyo University of Science

8TuPo.248

MEASUREMENT METHOD OF THE PV ARRAY PERFORMANCE BY USING PVMS AND OUTDOOR MEASURED I-V CURVE

Daiki Asai[1)], Yuzuru Ueda[1)], Yoshihiro Hishikawa[2)]

[1)] Tokyo University of Science, [2)] AIST

8TuPo.249

ANALYSIS ON RENEWABLE ENERGY SYSTEMS OPERATING AT MCAST CAMPUS, MALTA

Brian Azzopardi[1,2)], Nathaniel Cassar[1)], Renata Mikalauskiene[1)]

[1)] MCAST Energy Research Group, Malta College of Arts, Science and Technology (MCAST), [2)] Brian Azzopardi & Associates, Malta

8TuPo.250

OPTIMIZATION PROBLEM ON TRACKER ALLOCATION USING DIMENSIONLESS PARAMETERS – THEORY AND MENASUEMENT VALIDATION

Kenji Araki[1)], Kan-Hua Lee[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute

8TuPo.251

PERFORMANCE ANALYSIS OF A ROOFTOP PV PLANT AND A DESERT PV PLANT

Zou Xinjing[1)], Feifei Jiang[1)], Haitao Liu[1)]

[1)] Photovoltaic and Wind Power Systems, Quality Test Center Institute

of Electrical Engineering, Chinese Academy of Sciences

8TuPo.252

ONE YEAR OUTDOOR PERFORMANCE COMPARISON BETWEEN PERC AND HJT SOLAR SYSTEMS

I-Liang Chen[1)], Cheng-Lien Wang[1)], Min-An Tsai[2)], Hsin-Hsin Hsieh[2)], Paul P.C. Yang[3)], Wen-Lung Lu[4)]

[1)] Win Win Precision Technology Co., Ltd (WINAICO), [2)] Center for Measurement Standards, Industrial Technology Research Institute, [3)] Neo Solar Power Corporation (NSP),[4)] Department of Electrical Engineering, Chien Hsin University of Science and Technology

8TuPo.253

PV INSTALLED ON EV REDUCES WELL-TO-WHEEL CO2 EMISSIONS AND HAS GENERATION POTENTIAL TO REALISE CHARGE FREE EV

Takafumi Sato[1)], Shohei Namikawa[1)], Kaiichi Komoto[1)]

[1)] Environment and Energy Devision, Mizuho Information & Research Institute Inc.

Tuesday, November 14
16:00-18:00 Room7+8+9 Area9

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NOVEL USE OF PHOTOVOLTAIC SOLAR ENERGY BY THE WIDE AREA COMPUTER NETWORK INSTEAD OF POWER GRID CONNECTION

Kimihiko Saito[1)], Hideyuki Fukuhara[2,3)], Tetsu Saburi[2,3)], Michio Kondo[1,4)], Kenichiro Tomono[3,5)]

[1)] Faculty of Symbiotic Systems Science, Fukushima University, [2)] The University of Aizu, [3)] Cloud Business Alliance, [4)] Fukushima Renewable Energy Institute, Advansed Industrial Sience and Technology, [5)] EWM Japan

9TuPo.255

Impact of Battery Energy Storage with PV in University from Optimal Location and Sizing of Battery Considering Time of Use Rate (TOU) Using ABC Algorithm

Arnuphap Meechaka[1)], Anawach Sangswang[1)], Krissanapong Kirtikara[2)], Dhirayut Chenvidhya[2)], Panom Parinya[2)], Chamnan Limsakul[2)]

[1)] Department of Electrical Engineering, King Mongkut's University of Technology Thonburi, Thailand, [2)] CES Solar Cells Testing Center (CSSC), King Mongkut's University of Technology Thonburi (KMUTT), Thailand

9TuPo.256

AN EXPERIMENTAL STUDY ON P-F AND Q-V DROOP CONTROL OF PHOTOVOLTAIC POWER GENERATION BASED ON POWER OUTPUT CURTAILMENT CONTROL

Yuki Kimpara[1)], Muneaki Kurimoto[1)], Yusuke Manabe[1)], Toshihisa Funabashi[1)], Takeyoshi Kato[1)]

[1)] Nagoya University

9TuPo.257

A FUTURE-PROOF PILOT MICROGRID ENHANCING THE INTEGRATION OF PV GENERATION: 3D-MICROGRID PROJECT

Brian Azzopardi[1,6)], Francisco P. García-López[2)], Renata Mikalauskiene[1)], Jose L. Martnez-Ramos[2)], Alejandro Marano-Marcolini[2)], J. M. Maza-Ortega[2)], Manuel Barragn-Villarejo[2)], Salem Al-Agtash[3)], Lenos Hadjidemetriou[4)], Dimosthenis Ioannidis[5)]

[1)] MCAST Energy Research Group, Malta College of Arts, Science and Technology (MCAST), [2)] Electric Power Systems, ETSI, University of Seville, [3)] German Jordanian University, [4)] University of Cyprus, [5)] Center for Research and Technology Hellas / Information Technologies Institute, [6)] Brian Azzopardi & Associates

9TuPo.258

IMPACTS OF PHOTOVOLTAICS ON LOW VOLTAGE NETWORKS

Brian Azzopardi[1,2)], Gabdullin Yesbol Yerkinovich[1)], Carmel Xerri[3)], Karl Cilia[3)], George Portelli[3)]

[1)] MCAST Energy Research Group, Institute of Engineering and Transport, Malta College of Arts, Science and Technology (MCAST), [2)] Brian Azzopardi & Associates, [3)] Enemalta PLC

9TuPo.259

PROPOSAL OF POWER SYSTEM STATE ANALYSIS METHOD OVER A LONG TIME

Shunsuke Horie[1)], Yuji Iwane[1)], Tadahiro Goda[1)], Kazuto Yukita[1)], Toshiro Matsumura[1)], Yasuyuki Goto[1)]

[1)] Department of Electric Engeneer, Aichi Institute of Technology

9TuPo.260

REAL-TIME PRICING TO SECURE THE CAPACITY OF STORAGE BATTERIES FOR SUPPLY-DEMAND ADJUSTMENT

Tomoya Hirobe[1)], Jindan Cui[1)], Yuzuru Ueda[1)], Masakazu Koike[2)], Takayuki Ishizaki[3)], Jun-ichi Imura[3)]

[1)] Tokyo University of Science, [2)] Tokyo University of Marine Science and Technology, [3)] Tokyo Institute of Technology

9TuPo.261

PROPOSAL OF ELECTRIC-PRICE PLAN TO ACHIEVE TARGET POWER FLOW FOR DEMAND-SUPPLY CONTROL BY AGGREGATOR

Kengo Furue[1)], Jindan Cui[1)], Yuzuru Ueda[1)], Masakazu Koike[2)], Takayuki Ishizaki[3)], Jun-ichi Imura[3)]

[1)] Department of Electrical Engineering, Tokyo University of Science, [2)] Tokyo University of Marine Science and Technology, [3)] Tokyo

Institute of Technology

9TuPo.262

LESSONS LEARNED FROM RECENT DEMONSTRATIONS COMBINING PHOTOVOLTAIC GENERATION AND BATTERY STORAGE

Ben York[1)], Steven Coley[1)], Alex Magerko[1)], Cameron Riley[1)], Aminul Huque[1)]

[1)] Power Delivery and Utilization Electric Power Research Institute

9TuPo.263

ALLOCATION METHOD OF REQUEST POWER FLOW FOR HOUSE GROUP CLUSTERED BY CHARACTERISTIC OF HOUSE LOAD

Ryota Watanabe[1)], Yuzuru Ueda[1)], Masakazu Koike[2)], Takayuki Ishizaki[3)], Jun-ichi Imura[3)]

[1)] Department of Electrical Engineering, Tokyo University of Science, [2)] Tokyo University of Marine Science and Technology [3)] Tokyo Institute of Technology

9TuPo.264

OPTIMIZATION OF SOLAR MODULE TRANSPARENCY WITH HOUSEHOLD CONSUMPTION

Frank Hamelmann[1)], Kyle Pieper[2)], Johannes Weicht[1)]

[1)] Fachhochschle Bielefeld, [2)] University of Manitoba

Tuesday, November 14
16:00-18:00 Room7+8+9 Area10

10TuPo.265

OFFICIAL CERTIFIED PV MODULE REGISTRATION AND MANAGEMENT IN TAIWAN

Chia-Cheng Chou[1)], Hsien-Chen Ma[1)]

[1)] Energy & Environment Metrology Division, Center for Measurement Standards Industrial Technology Research Institute

10TuPo.266

SOLAR PHOTOVOLTAIC INTEGRATION IN WATER PUMPING SYSTEM

Brian Azzopardi[1,2)], Renata Mikalauskiene[1)], Antonio Espírito-Santo[3,4)], Andreas Kyprianou[5,7)], George E. Georghiou[6,7)]

[1)] MCAST Energy Research Group, Institute of Engineering and Transport, Malta College of Arts, Science and Technology (MCAST), [2)] Brian Azzopardi & Associates, [4)] Instituto de Telecomunicaes, [5)] Department of Mechanical and Manufacturing Engineering, University of Cyprus, [6)] Department of Electrical and Computer Engineering, PV Technology, University of Cyprus, [7)] FOSS Research Centre for Sustainable Energy, University of Cyprus

10TuPo.267

INTRODUCTION TO THE BASIC TRACK OF SOLAR MICROGRID CONVERGENCE TECHNOLOGY

Donghyun Hwang[1)], Chang-Sik Son[1)], Jinsoo Song[1)]

[1)] Silla University

10TuPo.268

NEXT-GENERATION EMERGING GREEN ENERGY INDUSTRY TECHNOLOGY WITH R&D -SHALUN GREEN ENERGY SCIENCE CITY

Kuo-Wei Huang[1)]

[1)] Green Energy and Environment Research Laboratories, Shalun Green Energy Science City Preparatory office

10TuPo.269

ENVIRONMENTAL ASSESSMENT OF VACUUM AND NON-VACUUM TECHNIQUES FOR THE FABRICATION OF Cu2ZnSnS4 (CZTS) THIN FILM PHOTOVOLTAIC CELLS

Mehrnoush Mokhtarimehr[1)], Ian Forbes[1)], Nicola Pearsall[1)]

[1)] Physics and Electrical Engineering NPAG, Department of Physics and Electrical Engineering, Northumbria University

10TuPo.270

THE ANALYSIS AND FORECAST OF THE ABANDONED AMOUNT FOR CHINA PV SYSTEM

Jia Zhang[1)], Lu Fang[1)]

[1)] Department of Renewable Energy, Institute of Electrical Engineering, Chinese Academy of Sciences

10TuPo.271

ANALYSIS OF COST-COMPETITIVENESS OF HYBRID III-V-SI CONCENTRATOR PHOTOVOLTAIC SYSTEMS

Kan-Hua Lee[1)], Kenji Araki[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute

10TuPo.272

SOLAR ENERGY BASED SUSTAINABLE LIVELIHOOD IN RESIDENTIAL BUILDINGS: AN APPROACH TOWARDS ZERO ENERGY BUILDINGS (ZEBS)

Dinesh K. Sharma[1)], Meenakshi Sharma[2)], Rajiv K. Chechi[1)]

[1)] Vidya College of Engineering, Meerut (Inida), [2)] Vidya Institute of Creative Teaching, Meerut (India)

10TuPo.273

IECRE A NEW CHALLENGE OF THE IEC FOR BANKABILITY OF PV POWER SYSTEMS

MASAAKI YAMAMICHI[1], Sarah Kurtz[2], George Kelly[3], Matthias Heinze[4], Hiroshi Takahashi[5]

[1] Reseach Division, RTS Corporation, [2] NREL, [3] Sunset Technology, [4] TUV-Rheinland, [5] Fuji Electric

10TuPo.274

IMPLEMENTATION OF A CIRCULAR ECONOMY BASED ON RECYCLED, REUSED AND RECOVERED INDIUM, SILICON AND SILVER MATERIALS FOR PHOTOVOLTAIC AND OTHER APPLICATIONS CABRISS – EU COLLABORATIVE PROJECT

Wolfram J. Palitzsch[1], Ulrich M. Loser[1]

[1] Loser Chemie GmbH

10TuPo.275

TRENDS IN PHOTOVOLTAIC APPLICATIONS - THE LATEST SURVEY RESULTS ON PV MARKETS AND POLICIES FROM THE IEA PVPS PROGRAMME

Gaëtan Masson[1], José Donoso[2], Izumi Kaizuka[2], Pius Hsser[3], Johan Lindhal[5], Francesca Tilli[6]

[1] Task 1 IEA PVPS, [2] UNEF, [3] RTS Corporation, [4] Nova Energie, [5] Svensk Solenergi, [6] GSE

Thursday, November 16
16:00-18:00 Room7+8+9 Area1

1ThPo.1

WET CHEMICAL ETCH-BACK SELECTIVE EMITTER FOR PERC SOLAR CELLS

Supawan Joonwichien[1], Yasuhiro Kida[1], Masaaki Moriya[1], Satoshi Utsunomiya[1], Katsuhiko Shirasawa[1], Hidetaka Takato[1]

[1] AIST

1ThPo.2

THIN CRYSTALLINE SILICON SOLAR CELLS WITH RIB STRUCTURE

Toshiki Otani[1], Satomi Takahashi[1], Kazuyoshi Nakada[2], Masakazu Hirai[3], Yukimi Ichikawa[1], Makoto Konagai[1]

[1] Electrical and Electronic Enginnering, Tokyo City University, [2] Tokyo Institute of Technology, [3] JST

1ThPo.3

CHARACTERIZATION OF ELECTRONIC PROPERTIES OF A-SI:H PASSIVATION LAYERS FOR SILICON HETERO-JUNCTION SOLAR CELLS

Shota Nunomura[1], Isao Sakata[1], Koji Matsubara[1]

[1] Research Center for Photovoltaics, National Institute of Advanced Industrial Science and Technology

1ThPo.4

INVESTIGATION OF HIGH-MOBILITY Ti-DOPED In2O3 (InOx:Ti) DEPOSITED BY PULSED DC MAGNETRON SPUTTERING FOR SOLAR CELL APPLICATIONS

Xia Yan[1], Krishanu Dey[1], Stella Van Eek[2], Sascha Kreher[2], Armin G. Aberle[1], Selvaraj Venkataraj[1]

[1] Solar Energy Research Institute of Singapore (SERIS), [2] FHR Anlagenbau GmbH

1ThPo.5

INVESTIGATION ON SURFACE PASSIVATION QUALITY OF NANOTEXTURED SILICON WAFER BY SPUTTERED AND ALD GROWN ALUMINUM OXIDE FILMS

Vamsi Krishna Komarala[1], Piyush Kumar Parashar[1], Jussi Toppari[2,3]

[1] Centre for Energy Studies, Indian Institute of Technology Delhi, [2] Nanoscience Centre, University of Jyvaskyla, [3] Department of Physics, University of Jyvaskyla

1ThPo.6

TBD

Lixin Song[1], Yi Zhang[1], Vineet Dua[1], Haixin Yang[1]

[1)] Research & Development Heraeus Precious Metals

1ThPo.7

Impact of the Cleaning Parameters for Multi Silicon via Dry etching Process

Cheng-Wen Kuo[1)], Ta-Ming Kuan[1)], Chih-Chiang Huang[1)], Li-Guo Wu[1)], Cheng-Yeh Yu[1)]

[1)] TSEC Corporation

1ThPo.8

NON-CONTACT MEASUREMENT OF FIELD-EFFECT PASSIVATION USING COMBINATION OF A LASER TERAHERTZ EMISSION MICROSCOPE AND A CORONA DISCHARGE

Akira Ito[1)], Toshimitsu Mochizuki[3)], Hidetoshi Nakanishi[1)], Jonathon Mitchell[3)], Katsuto Tanahashi[3)], Iwao Kawayama[2)], Masayoshi Tonouchi[2)], Katsuhiko Shirasawa[3)], Hidetaka Takato[3)]

[1)] SCREEN Holdins Co., Ltd., [2)] Institute of Laser Engineering, Osaka University, [3)] Fukushima Renewable Energy Institute, AIST

1ThPo.9

OPTO-ELECTRICAL MODELLING OF IBC SOLAR CELLS BASED ON HETEROJUNCTION CARRIER-SELECTIVE PASSIVATING CONTACTS

PAUL PROCEL[1)], GUANGTAO YANG[1)], OLINDO ISABELLA[1)], MIRO ZEMAN[1)]

[1)] DELFT UNIVERSITY OF TECHNOLOGY

1ThPo.10

IMPACT OF TRANSIENT TRAPPING ON STEADY STATE PHOTOCONDUCTANCE LIFETIME MEASUREMENTS

Yan Zhu[1)], Mattias K. Juhl[1)], Gianluca Coletti[2)], Ziv Hameiri[1)]

[1)] School of Photovoltaic and Renewable Energy Engineering, University of New South Wales, [2)] Energy Research Centre of the Netherlands

1ThPo.11

INVESTIGATION OF EFFECTIVE LIGHT TRAPPING STRUCTURE WITH SUB-MICRON SIZE FOR CRYSTALLINE SILICON THIN FILM SOLAR CELLS

Miki Sei[1)], Yasuyoshi Kurokawa[1)], Isao Takahashi[1)], Noritaka Usami[1)]

[1)] Department of Material Engineering, Nagoya University

1ThPo.12

MAPPING OF INTERNAL FIELD BETWEEN LOCALIZED CONTACTS IN BACK- CONTACT CELLS USING LASER TERAHERTZ EMISSION MICROSCOPE (LTEM)

Toshimitsu Mochizuki[1)], Akira Ito[2)], Tomihisa Tachibana[1)], Katsuto Tanahashi[1)], Masaaki Moriya[1)], Hidetoshi Nakanishi[2)], Iwao Kawayama[3)], Masayoshi Tonouchi[3)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)], Satoshi Utsunomiya[1)], Yasuhiro Kida[1)]

[1)] Fukushima Renewable Energy Institute, The National Institute of Advanced Industrial Science and Technology, [2)] SCREEN Holdings Co., Ltd., [3)] Institute of Laser Engineering, Osaka University

1ThPo.13

HIGH-QUALITY ALUMINUM-DOPED ZINC OXIDE FABRICATED BY A SEED LAYER APPROACH FOR THIN-FILM SILICON SOLAR CELL APPLICATIONS

Anh Huy Tuan Le[1)], Duy Phong Pham[1)], Cam Phu Thi Nguyen[1)], Junsin Yi[1)]

[1)] College of Information and Communication Engineering, Sungkyunkwan University

1ThPo.14

IRON CONTAMINATION NEAR SURFACE OF MC-SILICON SOLAR CELLS OBSERVED BY MÖSSBAUER SPECTROSCOPIC MICROSCOPE

Yuji Ino[1)], Kazuo Hayakawa[1)], Kenichi Yukihira[1)], Koichi Moriguchi[2)], Hiroyoshi Soejima[1)], Keiko Ogai[2)], Yoshihito Harada[2)], Katsuhiko Shirasawa[3)], Hidetaka Takato[3)], Yutaka Yoshida[1)]

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1ThPo.15

FLEXIBLE CRYSTALLINE SILICON SOLAR CELLS WITH VERTICALLY ALIGNED MICROWIRES

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1ThPo.16

ITO-FREE CARRIER SELECTIVE CONTACT FOR HIGH-EFFICIENCY CRYSTALLINE SI SOLAR CELLS

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1ThPo.17

LIGHT SOAKING ENHANCED PERFORMANCE OF ULTRA-THIN ALUMINUM OXIDE FILMS FOR PASSIVATED-CONTACT SILICON SOLAR CELLS

Zheng Xin[1,2)], Zhi Peng Ling[1)], Cangming Ke[1)], Er-Chien Wang[1)], Gurleen Kaur[2)], Armin G. Aberle[1,2)], Rolf Stangl[1)]

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1ThPo.18

INPROVEMENT OF MIRROR ETCHING PROCESS BY NEWLY SOLUTION FOR MONO CRYSTALLINE SILICON SOLER CELLS

Tsuyoshi Kawakami[1)], Hiroyuki Kanda[1)], Seigo Ito[1)]

[1)] University of Hyogo

1ThPo.19

UNDERSTANDING AND OVERCOMING DIFFERENTIAL SPECTRAL RESPONSE (DSR) MEASUREMENT ARTEFACTS FOR SOLAR CELLS WITH POOR SHUNT RESISTANCE

Jian Wei Ho[1)], Johnson Wong[1)], Percis Teena C S[1)], Samuel Raj[1)], Armin G. Aberle[1)]

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1ThPo.20

The properties of carrier selective tunnel oxide layer by using various chemical solutions for tunneling based solar cell application

Jinjoo Park[1)], Jiyoon Kang[1)], Cheolmin Park[2)], Shihyun Ahn[1)], Junsin Yi[1)]

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1ThPo.21

2DRES--A 2D NUMBERICAL PROGRAM FOR EXTRACTING RESISTANCE PROPERTIES OF INDUSTRIAL SOLAR CELLS

Lujia Xu[1)], Johnson Kai Chi Wong[1)]

[1)] Solar Energy Research Institute of Singapore, National University of Singapore

1ThPo.22

CARRIER SELECTIVE TRANSPORT PATH IN A MOLYBDENUM OXIDE/TUNNEL INSULATOR/N-CSI CELL

Yutaka Hayashi[1)], Takefumi Kamioka[1)], Yuki Isogai[1)], Kyotaro Nakamura[2)], Yoshio Ohsita[1)]

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1ThPo.23

DOUBLE LAYERED ALUMINUM OXIDE FILMS DEPOSITED BY REACTIVE SPUTTERING FOR SURFACE PASSIVATION OF CRYSTALLINE SILICON

Toshiya Marukane[1)], Daiki Oka[1)], Yasushi Hotta[1)], Haruhiko Yoshida[1)], Kouji Maeda[1)], Koji Arafune[1)]

[1)] University of Hyogo

1ThPo.24

SURFACE PASSIVATION USING SILICON OXIDE DEPOSITED BY ATMOSPHERIC PRESSURE PLASMA COATING SYSTEM

Thomas Mueller[1)], Natasha PYE[1)], Jia GE[1)], Markus PRINZ[2)], Thomas MARKERT[2)]

[1)] Solar Energy Research Institute of Singapore (SERIS), [2)] Plasmatreat Asia Pacific

1ThPo.25

INNOVATIVE PECVD REACTOR CONCEPT FOR SMART MANUFACTURING OF SILICON HETEROJUNCTION SOLAR CELLS

Silvia Martin de Nicolas[1)], Omid Shojaei[2)], Antoine Descoeudres[1)], Loris Barraud[1)], Fabrice Jeanneret[2)], Arnaud Limouzin[2)], Matthieu Despeisse[1)], Christophe Ballif[1)]

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1ThPo.26

ELECTRICAL AND OPTICAL PROPERTIES OF REGULAR PYRAMIDAL STRUCTURES IN SILICON SOLAR CELLS

Jeewoong Yang[1)], Se Jin Park[1)], Changhyun Lee[1)], Seungeun Park[1)], HyunJung Park[1)], Ji Yeon Hyun[1)], Yoonmook Kang[2)], Hae-seok Lee[1)], Donghwan Kim[1)]

[1)] Department of Materials science and engineering, and Optoelectronics Convergence Research Center, SERC, Korea University, [2)] KU-KIST Green School, Graduate School of Energy and Environment, Korea University

1ThPo.27

USE OF A TRANSFORMED DIODE EQUATION FOR CHARACTERIZATION OF THE IDEALITY FACTOR AND SERIES RESISTANCE OF CRYSTALLINE SILICON SOLAR CELLS BASED ON LIGHT I-V CURVES

Sujeong Jeong[1)], Yoonmook Kang[2)], Hae-seok Lee[2)], Soo Min Kim[3)], Donghwan Kim[1)]

[1)] Department of Materials Science and Engineering, Korea University, [2)] KU KIST Green School, Graduate School of Energy and Environment, Korea University, [3)] Energy Technology Research Center, Gumi Electronics & Information Technology Research Institute

1ThPo.28

Withdrawn

1ThPo.29

LOW COST, DOPANT-FREE HETEROJUNCTION INTERDIGITATED BACK CONTACT SOLAR CELL ON EXFOLIATED THIN CRYSTALLINE SILICON SUBSTRATE

Sung-Hae Kim[1)], Yoon-Ho Nam[1)], Jae-Won Song[1)], Jung-Ho Lee[1)]

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1ThPo.30

PROPERTIES OF PHOSPHORUS DOPED SILICON LAYER IN TUNNEL OXIDE PASSIVATED CONTACT SOLAR CELL

Changhyun Lee[1)], Se Jin Park[1)], Seungeun Park[1)], HyunJung Park[1)], Jeewoong Yang[1)], Ji yeon Hyun[1)], Yoonmook Kang[2)], Hae-Seok Lee[1)], DonghwanKim[1)]

[1)] Department of Materials science and engineering, Korea University, [2)] KU-KIST Green School, Graduate School of Energy and Environment, Korea University

1ThPo.31

UNDERSTANDING OF ANNEALING EFFECTS ON PASSIVATION QUALITY OF POLY-SI/SIOX/C-SI PASSIVATED CONTACTS

HyunJung Park[1)], Hyomin Park[1)], Se Jin Park[1)], Soohyun Bae[1)], Seungeun Park[1)], Jee Woong Yang[1)], Ji Yeon Hyun[1)], Yoonmook Kang[2)], Hae-Seok Lee[2)], Donghwan Kim[1)], Chang Hyun Lee[1)], Seung Hyun Shin[1)]

[1)] Korea University, [2)] KU-KIST Green School Graduate School of Energy and Environment

1ThPo.32

FULLY ION IMPLANTED N-TYPE BIFACIAL SILICON SOLAR CELL

Katsuto Tanahashi[1)], Masaaki Moriya[1)], Shalamujiang Simayi[1)], Yasuhiro Kida[1)], Satoshi Utsunomiya[1)], Tetsuo Fukuda[1)], Katsuhiko Shirasawa[1)], Hidetaka Takato[1)]

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1ThPo.33

MULTI-LAYER PECVD FOR IMPROVED SURFACE PASSIVATION OF SOLAR CELLS.

Jonatho Mitchell[1)]

[1)] Photovoltaic Power Team, The National Institute of Advanced Industrial Science and Technology (AIST)

1ThPo.34

A STUDY OF THE LASER ABLATION PATTERN OPTIMIZATION OF PERC PASSIVATION LAYER.

Eunggoo Lee[1)], Seunghoon Lee[1)], Soohyun Bae[1)], Yoonmook Kang[1)], Hae-Seok Lee[1)], Donghwan Kim[1)]

[1)] Korea University

1ThPo.35

APPLICATION OF INKJET PRINTING TO BACK CONTACT PATTERNING OF THIN IBC-SHJ SOLAR CELLS

Kimihiko Saito[1)], Hideyuki Takagishi[1,2)], Hiroshi Noge[1)], Michio Kondo[1,3)], Kimihiko Saito[1)]

[1)] Faculty of Symbiotic Systems Science, Fukushima University, [2)] Japan Advanced Institute of Science and Technology, [3)] Fukushima Renewable Energy Institute, Advansed Industrial Sience and Technology

1ThPo.36

PASSIVATED MOLYBDENUM OXIDE CONTACTS FOR CRYSTALLINE SILICON SOLAR CELLS

Woojun Yoon[1)], James E. Moore[2)], David Scheiman[1)], Eunhwan Cho[3)], Young-Woo Ok[3)], Nicole A. Kotulak[4)], Phillip P. Jenkins[1)], Ajeet Rohatgi[3)], Robert J. Walters[1)]

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1ThPo.37

TRANSMISSION ELECTRON MICROSCOPY OF SPHERICAL SILICON SOLAR CELLS WITH SNOX:F ANTI-REFLECTION FILMS

Takeo Oku[1)], Youichi Kanamori[2)], Mikio Murozono[2)]

[1)] Department of Materials Science, The University of Shiga Prefecture, [2)] Clean Venture 21 Co.

1ThPo.38

EFFECTS OF HYDROGEN PEROXIDE TREATMENT ON a-Si:H(i) PASSIVATION LAYER DEPOSITED BY FACING TARGET SPUTTERING (FTS) METHOD

Faris Akira Bin Mohd Zulkifly[1)], Yuta Shiratori[1)], Kazuyoshi Nakada[1)], Shinsuke Miyajima[1)]

[1)] Department of Electrical and Electronic Engineering, Tokyo Institute of Technology

1ThPo.39

IGNITION CONTROL OF THE EXPLOSIVE CRYSTALLIZATION OF AMORPHOUS SILICON FILMS BY FLASH LAMP ANNEALING

Daiki Sato[1)], Keisuke Ohdaira[1)]

[1)] Japan Advanced Institute Science and Technology

1ThPo.40

MODULATION OF DEPOSITION TEMPERATURE OF TIO2 FOR PASSIVATIING ELECTRON SELECTIVE CONTACT FOR SILICON HETEROJUNTION SOLAR CELL

Takeya Mochizuki[1)], Kazuhiro Gotoh[1)], Isao Takahashi[1)], Yasuyoshi Kurokawa[1)], Noritaka Usami[1)]

[1)] Graduate School of Engineering, Nagoya University

1ThPo.41

DISTRIBUTION OF OXYGEN PRECIPITATES IN HIGH PERFORMANCE MC-SILICON

Ryohei Nakayama[1)], Takuto Kojima[1)], Atsushi ogura[1)], Kentaro Kutsukake[2)]

[1)] Department of Electronics, Meiji University, [2)] Tohoku University

1ThPo.42

GAS TEMPERATURE DETERMINATION AT MICROCRYSTALLINE SILCON FILM GROWTH UNDER HIGH GROWTH RATE CONDITION USING VHF-PECVD METHOD

Yasushi Sobajima[1)], Haruka Kubota[1)], Akihisa Matsuda[1)], Hiroaki Okamoto[1)]

[1)] Graduate School of Engineering, Science Osaka University

1ThPo.43

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Roman Bansen[1)], Christian Ehlers[1)], David Uebel[1)], Thomas Teubner[1)], Torsten Boeck[1)]

[1)] Leibniz Institute for Crystal Growth (IKZ)

1ThPo.44

BANDGAP-VOLTAGE OFFSET OF THIN SILICON SOLAR CELLS

André Augusto[1)], Richard R. King[1)], Christiana Honsberg[1)], Stuart G. Bowden[1)]

[1)] School of Electrical, Computer and Energy Engineering, Arizona State University

1ThPo.45

EXTREMELY HIGH-FREQUENCY IMPEDANCE ANALYSIS ON PASSIVATION FILM WITH LARGE LEAKAGE CURRENT FOR PASSIVATTED CONTACTS

Takuto Kojima[1)], Takuya Hiyama[1)], Tappei Nishihara[1)], Kyotaro Nakamura[1)], Atsushi Ogura[1)], Yoshio Ohshita[2)]

[1)] School of Science and Technology, Meiji University, [2)] Toyota Technological Institute

1ThPo.46

PASSIVATION EFFECT OF ULTRA-THIN SINX FILMS FORMED BY CAT-CVD FOR CRYSTALLINE SILICON SURFACES

Hao Song[1)], Keisuke Ohdaira[1)]

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1ThPo.47

CHARACTERIZATION OF p-type Cu2O:N/n-type μc-Si:H TUNNEL RECOMBINATION JUNCTION FOR PEROVSKITE/ c-Si TANDEM SOLAR CELLS

Jinwoo Kim[1)], Yuki Takiguchi[2)], Shinsuke Miyajima[1)]

[1)] Department of Electrical and Electronic Engineering, Tokyo Institute of Technology, [2)] Depertment of Physical Electronics, Tokyo Institute of Technology

1ThPo.48

PREPARATION OF Si AND Ge THIN FILM BY INDUCTIVELY COUPLED PLASMA ASSISTED REACTIVE SPUTTERING

Dongju Shim[1)], Tetsuya Kaneko[1)], Kunio Okimura[1)], Haruo Shindo[2)], Masao Isomura[1)]

[1)] Department of Electrical and Electronic Engineering, Tokai University, [2)] Plasma Science and Engineering Institute

1ThPo.49

CHARACTERIZATION OF COPPER IODIDE HOLE-SELECTIVE LAYER FOR SILICON SOLAR CELL APPLICATIONS

Kiseok Jeon[1,2)], Hongsub Jee[1)], Sangwoo Lim[2)], Chaehwan Jeong[1)]

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1ThPo.50

DEPOSITION MECHANISM OF AMORPHOUS SILICON THIN FILM ON SILICON WAFER WITH <100> AND <111> ORIENTATION

Liping Zhang[1)], Renfang Chen[1)], Zhuopeng Wu[1)], Zhengxin Liu[1)]

[1)] Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences

1ThPo.51

SPRAY COATING OF EXTREMELY CONFORMAL TITANIUM OXIDE THIN FILMS FOR ANTIREFLECTION ON TEXTURED SILICON

Thomas Gascou[1)], Zhiming Kam[1)], Florian Palitschka[2)], Ananthanarayanan Krishnamoorthy[1)], Xinhang Li[1,3)], Mei Gi Toh[1)], Armin G. Aberle[1,3)], Fen Lin[1)]

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1ThPo.52

ARTIFACTS IN PHOTOLUMINESCENCE IMAGING FOR SILICON WAFERS AND SOLAR CELLS

Hannes Höffler[1)], Georg Dost[1)], Andreas Brand[1)], Florian Schindler[1)],

Martin Schubert[1)], Johannes Greulich[1)]

[1)] PV Production Technology and Quality Assurance, Fraunhofer ISE

1ThPo.53

ACCELERATING LCO DEVELOPMENT – FROM LINES TO DOTS

Alma Spribille[1)], Andreas A. Brand[1)], Jan Hofmann[1)], Gernot Emanuel[1)], Jan Nekarda[1)], Nakahara Masahiro[2)], Marwan Dhamrin[2)]

[1)] MWT Solar Cells / Printing Technology, Fraunhofer ISE, [2)] Toyo Aluminium K. K.

1ThPo.54

CHARGED STRONTIUM SILICATE LAYER FOR FIELD EFFECT PASSIVATION OF SILICON SOLAR CELLS

Yasushi Hotta[1)], Shota Taniwaki[1)], Haruhiko Yoshida[1)], Koji Arafune[1)], Shin-ichi Satoh[1)]

[1)] Department of Engineering, University of Hyogo

1ThPo.55

CHARGE PROPERTIES OF STACKING STRUCTURE OF DIPOLE INTERFACED AND ITS FIELD EFFECT PASSIVATION EFFECT

Ikuya Saiki[1)], Shintaro Nishi[1)], Haruhiko Yoshida[1)], Koji Arafune[1)], Shin-ichi Satoh[1)], Yasushi Hotta[1)]

[1)] Graduate School of Engineering, University of Hyogo

1ThPo.56

THE STRUCTURE CHANGE AND ELECTRICAL CHARACTERISTICS WITH VARIED ANNEALING CONDITION OF AMORPHOUS SILICON/ THIN SILICON OXIDE/ CRYSTALLINE SILICON STRUCTURE

Sungjin Choi[1,2)], Kwan Hong Min[1,2)], Myeong Sang Jeong[1,2)], Jeong In Lee[1)], Min Gu Kang[1)], Hee-eun Song[1)], Donghwan Kim[2)], Ka-Hyun Kim[1)]

[1)] Photovoltaic Laboratory, Korea Institute of Energy Research, [2)] Korea University

1ThPo.57

IMPACT OF PEDOT: PSS AND LIGHT SOAKING ON PASSIVATION PROPERTIES OF ULTRATHIN ATOMIC LAYER DEPOSITED TIOX LAYERS

Gurleen Kaur[1,2)], Neeraj Dwivedi[1)], Zheng Xin[2)], Baochen Liao[2)], Zhi Peng Ling[2)], Rolf Stangl[2)], Aaron Danner[1)]

[1)] Spin and Energy Lab, Department of Electrical and Computer Engineering, National University of Singapore, [2)] Solar Energy Research Institute of Singapore, National University of Singapore

1ThPo.58

PHOTOLUMINESCENCE AND ELECTROLUMINESCENCE CHARACTERISTICS FROM Si AND Ge HETEROJUNCTION SOLAR CELLS

Makoto Konagai[1)], Rei Kondo[1)], Kentarou Sawano[1)], Yukimi Ichikawa[1)]

[1)] Advanced Research Laboratories, Tokyo City University

1ThPo.59

DEVELOPMENT OF SILICON HETEROJUNCTION SOLAR CELL TECHNOLOGY FOR MANUFACTURING

Xixiang Xu[1)], Cao Yu[1)], Miao Yang[1)], Gangqiang Dong[1)], Fuguo Peng[1)], Chengjian Hong[1)], Ge Cui[1)], Hui Yan[2)], Jinyan Zhang[1)], Yuanmin Li[1)], Yongcai He[2)]

[1)] Chengdu R&D Center, Hanergy Thin Film Power Ltd., [2)] Beijing University of Technology, College of Materials S&E

1ThPo.60

Study of the Silicon Crystallization on Aluminum-Induced Crystallization According to the Aluminum Deposition Temperatures

Doo Won Lee[1)], Muhammad Fahad Bhopal[1)], Soo Hong Lee[1)]

[1)] Department of Electronics Engineering, Sejong University

1ThPo.61

ADVANCED TEMPERATURE-DEPENDENT CHARACTERIZATION OF SILICON NITRIDE SURFACE PASSIVATION LAYER

Shuai Nie[1)], Yan Zhu[1)], Simone Bernardini[2)], Mariana Bertoni[2)], Ziv Hameiri[1)]

[1)] The University of New South Wales, [2)] Arizona State University

1ThPo.62

Influence of internal stress on Ni/Cu/Ag plated contact of crystalline Si solar cells for enhancing adhesion reliability

Sang Hee Lee[1)], Ah Reum Lee[1)], Han Jun Kim[1)], Soo Hong Lee[1)]

[1)] Department of Electronics Engineering, Sejong University

1ThPo.63

IMPROVED HOT-ZONE FOR MANUFACTURING LOW-OXYGEN SILICON INGOTS FOR PERC

Sungsun Baik[1)], Boram Lee[1)], Youngsik Hahn[1)], Wooseok Nam[1)]

[1)] R&D Center, Woongjin Energy Co. Ltd.

1ThPo.64

PERFORMANCE OF OPTICAL WIRELESS POWER TRANSFER

SYSTEM USING A VERTICAL CAVITY SURFACE EMITTING LASER ARRAY

Shinsuke Miyajima[1)], Kazuyoshi Nakada[1)], Yuta Shiratori[1)], Jinwoo Kim[1)], Tomoyuki Miyamoto[1)], Kunta Yoshikawa[2)], Kenji Yamamoto[2)]

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1ThPo.65

THE STUDY ON THE OXYGEN AND CARBON CONCENTRATION TO INGOTS WITH 2 AND 3 METER IN LENGTH GROWN BY CZOCHRALSKI ETHOD FOR SOLAR CELLS

Kwanghun Kim[1)], Sungsun Baik[1)]

[1)] Growing Technology Team, Woongjin Energy

1ThPo.66

IMPROVING THE 3 IN 1 SUITABLE REAR EMITTER OF HIGH EFFICIENCY SILICON HETEROJUNCTION REAR EMITTER CELL

Sang Ho Kim[1)], Jin joo Park[2)], Pham Duy Phong[2)], Young jun Kim[2)], Jong hoon Shin[1)], Junsin Yi[2)]

[1)] Department of Energy Science, Sungkyunkwan University, [2)] College of Information and Communication Engineering, Sungkyunkwan University

1ThPo.67

DARK I-V CHARACTERISTICS OF A SOLAR CELL FABRICATED AT VARIOUS GAS FLOW INJECTION TEMPERATURES

Jackson Bweupe[1)], Jeong eun Park[2)], Taewoo Eom[1)], Sang Yong Park[1)], Jung Hoon Park[1)], Donggun Lim[1,2)]

[1)] Department of IT convergence, Korea National University of Transportation, [2)] Department of Electronic Engineering, Korea National University of Transportation

1ThPo.68

OPTIMIZATION OF FRONT AND BACK CONTACT FORMATION OF HYBRID (FRONT-SIDE DIFFUSED, REAR-SIDE HETEROJUNCTION) SOLAR CELL PRE-CURSORS

Mei Huang[1)], Puqun Wang[1)], Ning Chen[1)], Esber Michelle Liwanag[1)], Rolf Stangl[1)]

[1)] Solar Energy Research Institute of Singapore (SERIS), National University of Singapore (NUS)

Thursday, November 16
16:00-18:00 Room7+8+9 **Area2**

2ThPo.69

ALD-DEPOSITED ZNTIO BUFFER LAYER FOR CU(IN,GA)SE2 THIN FILM SOLAR CELLS

Suhwan Hwang[1)], Hojin Lee[1)], Sun-Cheol Kim[2)], Byung Tae Ahn[1)], Byungha Shin[1)]

[1)] Department of Materials Science and Engineering, Korea Advanced Institute of Science and Technology (KAIST), [2)] Samsung Electronics Co., Ltd.

2ThPo.70

FIRST PRINCIPLES STUDY ON PHASE STABILITIES AND ELECTRONIC STRUCTURES OF STANNITE-TYPE CuIn5Se8 AND RELATED COMPOUNDS, CuIn5S8, CuGa5Se8, CuGa5S8, AgIn5Se8, AgIn5S8, AnGa5Se8, and AgGa5S8

Seitarou Nakashima[1)], Tsuyoshi Maeda[1)], Takahiro Wada[1)]

[1)] Department of Materials Chemistry, Ryukoku University

2ThPo.71

EFFECT OF SODIUM ADDITION FOR CTS THIN-FILM SOLAR CELLS FABRICATED ON AN ALKALI-FREE GLASS SUBSTRATE

Shohei Sasagawa[1)], Genki Nishida[1)], Akiko Takeuchi[1)], Hironori Katagiri[1)], Hideaki Araki[1)]

[1)] National Institute of Technology, Nagaoka College

2ThPo.72

EFFECTS OF RUBIDIUM FLUORIDE POST-DEPOSTION TREATMENT ON CU(IN, GA)SE2 GRWON ON FLEXIBLE SUBSTRATES

Hojin Lee[1)], Soomin Song[2)], Kihwan Kim[2)], Byungha Shin[1)]

[1)] Korea Advanced Institute of Science and Technology, [2)] Korea Institute of Energy Research (KIER)

2ThPo.73

EFFECT OF INTERFACIAL COMPOUNDS BETWEEN BACK ELECTRODE AND ABSORBER ON PERFORMANCE IN ZNSNP2 SOLAR CELLS

Taro Kuwano[1)], Shigeru Nakatsuka[1)], Yoshitaro Nose[1)]

[1)] Kyoto University

2ThPo.74

HIGH-EFFICIENCY CZTSE SOLAR CELLS PREPARED BY PULSE CURRENT ELELCTRODEPOSITION AND SELENIZATION AT LOW SE VAPOR PRESSURE

Ming-Jer Jeng[1)], Liyong Yao[2)], Jinlian Bi[2)], Jianping Ao[2)], Zhaojing Zhang[2)], Guozhong Sun[2)], Yun Sun[2)], Liann-Be Chang[1)]

[1)] Chang Gung University, [2)] Nankai University

2ThPo.75

In2S2:M (M=V, Ti, Nb) FILMS FOR INTERMEDIATE BAND SOLAR CELLS

Roland Scheer[1)], Leonard Wägele[1)], Tanja Jawinski[1)], Galina Gurieva[2)], Holger von Wenckstern[3)], R. Scheer[1)]

[1)] Institute of Physics Martin-Luther-Universität, [2)] Helmholtz-Zentrum Berlin, Department Structure and Dynamics of Energy Materials, [3)] Universitt Leipzig, Institute of Experimental Physics II

2ThPo.76

COMPOSITION CHANGES IN SPUTTERED HOMOGENEOUS Zn(O1-X,SX) THIN FILMS FOR Cu(In,Ga)Se2 THIN-FILM SOLAR CELL APPLICATIONS

Dae-Hyung Cho[1,2)], Jae-Hyung Wi[1)], Woo-Jung Lee[1)], Hye-Jung Yu[1)], Won Seok Han[1)], Byungha Shin[2)], Yong-Duck Chung[1,3)]

[1)] Electronics and Telecommunications Research Institute (ETRI), [2)] Korea Advanced Institute of Science and Technology (KAIST), [3)] Korea University of Science and Technology (UST)

2ThPo.77

FABRICATION OF P-TYPE CONDUCTIVE BaCuSF SINGLE LAYER AND BaCuSF/ITO BILAYER FILMS AND PPLICATION TO BACK CONTACT OF CdS/CdTe SOLAR CELLS

Kenji Miki[1)], Toshiyuki Kawabe[1)], Yasuyoshi Shiina[2)], Shota Okamoto[2)], Tamotsu Okamoto[2)], Takahiro Wada[1)]

[1)] Department of Materials Chemistry, Ryukoku University, [2)] National Institute of Technology, Kisarazu College

2ThPo.78

FIRST PRINCIPLES STUDIES ON FORMATION OF MoSe2 AT INTERFACES BETWEEN ABSORBER AND Mo LAYERS IN Cu(In,Ga)Se2 AND Cu2ZnSn(S,Se)4 SOLAR CELLS

Akio Shigemi[1)], Takahiro Wada[1)]

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2ThPo.79

CHARACTERIZATION OF AgGaTe2 LAYER PREPARED BY VARYNG Ag/Ga RATIO AND ANALYSIS OF PHASE DIAGRAM

Aya Uruno[1)], Yohei Sakurakawa[1)], Masakazu Kobayashi[1,2)]

[1)] Department of Electrical Engineering and Bioscience, Waseda University, [2)] Waseda University, Lab. for Mat. Sci. & Tech.

2ThPo.80

OPTICAL PROPERTIES AND ELECTRONIC PROPERTIES OF Cu2Zn(Ge,Sn)Se4 AND Cu2Zn(Ge,Sn)S4

Kensuke Tsuji[1)], Tsuyoshi Maeda[1)], Takahiro Wada[1)]

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2ThPo.81

OPTICAL PROPERTIRS AND BAND STRUCTURES OF Cu2(Ge,Sn)S3 AND Cu2(Ge,Sn)Se3

Qing Chen[1)], Tsuyoshi Maeda[1)], Takahiro Wada[1)]

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2ThPo.82

ENHANCEMENT OF OPEN-CIRCUIT-VOLTAGE BY HEAT-LIGHT SOAKING FOR NAF-BASED ALKALI TREATED CIGS SOLAR CELLS

Junpei Matsuura[1)], Kosuke Shudo[1)], Ishwor Khatri[2)], Mutsumi Sugiyama[1,2)], Tokio Nakada[2)]

[1)] Faculty of Science and Technology, Tokyo University of Science, [2)] Research Institute for Science and Technology, Tokyo University of Science

2ThPo.83

GROWTH OF SRGE2 THIN FILMS ON GE SUBSTRTES

Toshifumi Imajo[1)], Kaoru Toko[1)], Ryota Takabe[1)], Takashi Suemasu[1)]

[1)] University of Tsukuba

2ThPo.84

INFLUENCE OF SUBSTRATE TEMPERATURE ON THE PROPERTIES OF RF SPUTTERED TIN SULFIDE THIN FILMS FOR SOLARCELL APPLICATIONS

Jeha Kim[1)], Vinaya Kumar Arepalli[1)], Younbae Shin[1)], Cha Ran Lee[1)]

[1)] Cheongju University

2ThPo.85

AG-SN-S SYNTHESIS BY SOLID-PHASE REACTION FROM BINARY SULFIDES

Panha Eang[1)], Hideaki Araki[2)], Yoji Akaki[3)], Mitsuki Nakashima[4)], Toshiyuki Yamaguchi[4)], Satoru Seto[5)], Shigeyuki Nakamura[1)]

[1)] National Institute of Technology, Japan Tsuyama College, [2)] National Institute of Technology, Japan Nagaoka College, [3)] National Institute of Technology, Japan Miyakonojo College, [4)] National Institute of Technology, Japan Wakayama College, [5)] National Institute of Technology, Japan Ishikawa College

2ThPo.86

EPITAXIAL CIGS THIN FILMS ON MO BACK CONTACT FOR SOLAR CELLS

Yuta Ando[1)], Takeru Yamagami[1)], Ishwor Khatri[2)], Mutsumi Sugiyama[1,2)], Tokio Nakada[2)]

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2ThPo.87

FABRICATION OF HYBRID Zn(O,S)/CdS BUFFER LAYER FOR

CIGS SOLAR CELL

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2ThPo.88

FABRICATION OF CIGSE SOLAR CELLS BY USING NON-VACUUM ULTRASONIC SPRAY PYROLYSIS

SeongYeon Kim[1)], JunHo Kim[1)]

[1)] Incheon National University

2ThPo.89

FABRICATION OF INP THIN FILM BY PHOSPHIDATION

Yuming Yang[1)], Ryoji Katsube[1)], Shigeru Nakatsuka[1)], Yoshitaro Nose[1)]

[1)] Kyoto University

2ThPo.90

OPTICAL ABSORPTION SPECTRA OF Cu2ZnSn(S,Se)4 THIN FILM SOLAR CELLS BY FOURIER TRANSFORM PHOTOCURRENT SPECTROSCOPY

Abd Rahman binti Nur Syazwana[1)], Tanabe Kouki[1)], Itoh Takashi[1)], Nonomura Shuichi[1)], Sugimoto Kanta[2)], Yamada Akira[2)]

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2ThPo.91

CuInS2 THIN FILM GROWTH ON GLASS SUBSTRATE BY PLD METHOD

RAUL PAUCAR RAMOS[1)], RYO YOKOJIMA[1)], Hayime Shimada[1)], YONG-GU SHIM[2)], KAZUKI WAKITA[1)]

[1)] CHIBA INSTITUTE OF TECHNOLOGY, [2)] OSAKA PREFECTURE UNIVERSITY

2ThPo.92

Composition analysis and evaluation of CZTS films deposited by PLD

YUTA GOTO[1)], MASAHIRO KOTANI[1)], YONG-GU SHIM[2)], KAZUKI WAKITA[1)]

[1)] CHIBA INSTITUTE OF TECHNOLOGY, [2)] OSAKA PREFECTURE UNIVERSITY

2ThPo.93

SOLID-PHASE CRYSTALLIZATION OF DENSITY-CONTROLLED AMORPHOUS SI1-XGEX THIN FILMS ON GLASS

Daichi Takahara[1)], Kaoru Toko[1)], Ryota Yoshimine[1)], Takashi Suemasu[1)]

[1)] University of Tsukuba

2ThPo.94

ANNEALING EFFECT FOR SNS THIN FILMS PREPARED BY RF-MAGNETRON SPUTTERING

Donghyun Hwang[1)], Chang-Sik Son[1)]

[1)] Silla University

2ThPo.95

ANALYISIS OF CRYSTAL GROWTH AND DIFFUSION PROCESS IN CHALCOPYRITE PHOTOVOLTAIC MATERIALS

Takumi Kobayashi[1)], Takeshi Umehara[2)], Shigeru Yamada[1)], Kazuyoshi Nakada[1)], Akira Yamada[1)]

[1)] Department of Electrical and Electronic Engineering, Tokyo Institude of Technology, [2)] Department of Physical Electronics, Tokyo Institute of Technology

2ThPo.96

INFLUENCE OF Mo MICROSTRUCTURAL PROPERTIES ON THE FORMATION OF MoS2 THIN FILM IN SULPHURIZATION PROCESS

NOWSHAD AMIN[1,2)], P. Chelvanathan[2)], S. A. Shahahmadi[1)], Z. Zakaria[2)], Y. Yusof[1)], M. T. Ferdaous[1)], M. M.I. Sapeli[1)], M. Akhtaruzzman[2)], K. Sopian[2)]

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2ThPo.97

INFLUENCE OF TCO RESISTANCE IN CIGS THIN FILM SOLAR CELLS BY LUMINESCENCE METHOD

Tzu-Huan Cheng[1)], Shih-Hung Lin[2)]

[1)] LiveStrong Optoelectronics, [2)] Department of Electrical Engineering, Tunghai University

2ThPo.98

GROWTH OF CU(IN1-XGAX)SE2 MONOGRAIN POWDER CRYSTALS IN MOLTEN POTASSIUM IODIDE

Kristi Timmo[1)], Marit Kauk-Kuusik[1)], Maris Pilvet[1)], Jaan Raudoja[1)], Tiit Varema[1)], Mare Altosaar[1)], Maarja Grossberg[1)], Valdek Mikli[1)]

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2ThPo.99

INFLUENCE OF AIR ANNEALING ON CdS/Cu(In,Ga)Se2 MONOGRAIN LAYER SOLAR CELLS

Marit Kauk-Kuusik[1)], Kristi Timmo[1)], Maris Pilvet[1)], Maarja Grossberg[1)], Jri Krustok[1)], Kaia Ernits[2)]

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2ThPo.100

LIGHT-WEIGHT AND BENDABLE CDS/CDTE THIN-FILM SOLAR CELLS FOR SPACE APPLICATIONS

Jihyun Kim[1)], EunWoo Cho[1)], Donghwan Kim[2)], Gwangseok Yang[1)]

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2ThPo.101

CONCEPT OF BACK CONTACT IN CIGS SOLAR CELLS FOR HIGHER EFFICIENCY

Mikihiko Nishitani[1)], Takahiro Wada[2)]

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2ThPo.102

FABRICATION AND OPTIMIZATION OF VACUUM FREE HYBRID SOLAR CELLS PREPARED WITH COMPOSITES OF ZINC OXIDE NANOPARTICLES AND LOW BAND GAP POLYMER

Nguyen Tam Nguyen Truong[1)], Chinho Park[1)], Jae Hak Jung[1)]

[1)] Chemical Engineering Department, Yeungnam University

2ThPo.103

STUDY OF THE SEMICONDUCTING PROPERTIES OF Cu2ZnSnS4 (CZTS) ULTRATHIN FILMS GROWN BY ULTRASONIC SPRAY PYROLYSIS OF WATER-DISSOLVED PRECURSORS

Ignacio Estevez-Espinoza[1)], Yasuhiro Matsumoto[1,2)], Mauricio Ortega-López[1,2)]

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2ThPo.104

GROWTH AND CHARACTERIZATION OF COPPER ANTIMONY SULFIDE CRYSTALS

Manato Takeuchi[1)], Akira Nagaoka[2)], Shigeru Ikeda[3)], Kenji Yoshino[1)]

[1)] Department of Applied Physics and Electronic Engineering, University of Miyazaki, [2)] Kyoto University, [3)] Konan University

2ThPo.105

CRYSTALLOGRAPHIC, AND OPTICAL PROPERTIES OF CHALCOPYRITE-TYPE (Cu1-xAgx)InSe2 AND STANNITE-TYPE (Cu1-xAgx)In3Se5 AND (Cu1-xAgx)In5Se8 SYSTEMS

Tomoya Ishida[1)], Tsuyoshi Maeda[1)], Takahiro Wada[1)]

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2ThPo.106

EFFECT OF LOW-TEMPERATURE POST-DEPOSITION ANNEALING ON ELECTROCHEMICALLY DEPOSITED CUPROUS OXIDE THIN-FILMS

Yuki Takiguchi[1)], Aoi Orisaka[1)], Shinsuke Miyajima[1)]

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2ThPo.107

EVALUATION OF SrCuSeF AS A P-TYPE TCO FOR TUNNEL JUNCTION OF THIN FILM TANDEM SOLAR CELLS

Kazuyoshi Nakada[1)], Nana Chiwaki[1)], Kenji Miki[2)], Takahiro Wada[2)], Akira Yamada[1)]

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2ThPo.108

STRACTURAL CHARACTERIZATION T OF SN-S THIN FILMS DEPOSITED BY A THERMAL EVAPORATION METHOD

Yoji Akaki[1)], Kazuya Iwasaki[1)], Shigeyuki Nakamura[2)], Hideaki Araki[3)]

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2ThPo.109

EPITAXIAL GROWTH OF CIGS THIN LAYERS ON SINGLE CRYSTALLINE SUBSTRATES BY THREE-STAGE PROCESS

Jiro Nishinaga[1)], Takeyoshi Sugaya[1)]

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2ThPo.110

TEMPERATURE-DEPENDENT RAMAN SPECTROSCOPY ANALYSIS OF Cu2(Sn1-xGex)S3 THIN FILMS

Takayoshi Okamura[1)], Myo Than Htay[1,2)], Kohei Yamaguchi[1)], Noriyuki Urakami[1,2)], Noritaka Momose[3)], Kentaro Ito[1)], Yoshio Hashimoto[1,2)]

[1)] Department of Electrical and Computer Engineering, Shinshu University, [2)] ICST, [3)] NIT Nagano Coll.

2ThPo.111

INFLUENCE OF KF TREATMENT ON ELECTRONIC PROPERTIES OF CIGSSE SOLAR CELLS STUDIED BY

ADMITTANCE SPECTROSCOPY

Shenghao Wang[1)], Xia Hao[1)], Muhammad Monirul Islam[1)], Katsuhiro Akimoto[1)], Takuya Kato[2)], Hiroki Sugimoto[2)], Takeaki Sakurai[1)]

[1)] Institute of Applied Physics, University of Tsukuba, [2)] Atsugi Research Center, Solar Frontier K. K.

2ThPo.112

Variation with the deposition rate of cadmium sulfide for CIGS solar cell

Sung-Min Youn[1,2)], Dahye Jeong[1)], JinHyeok Kim[2)], Chaehwan Jeong[1)]

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2ThPo.113

EFFECT OF HYDRAZINE ON THE PROPERTIES OF ZINC SULFIDE BUFFER LAYER SYNTHESIZED BY CHEMICAL BATH DEPOSITION FOR SOLAR CELL APPLICATION

Jeha Kim[1)], Charan Lee[1)], Younbae Shin[1)], Vinaya kumar Arepalli[1)], Woo-jung Lee[2)], Yong-Duck Chung[2)]

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2ThPo.114

ANALYSIS OF FAST REACTION THIOACETAMIDE-ZnS BUFFER LAYER FOR CIGS THIN FILM SOLAR CELL

Jung Hoon Park[1)], Jeong Eun Park[2)], Taewoo Eom[1)], Sang Yong Park[1)], Jackson Bweupe[1)], Donggun Lim[1,2)]

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2ThPo.115

INFLUENCE OF ZnO:Al TRANSPARENT ELECTRODE USING RF MAGNETRON SPUTTERING ON CIGS THIN FILM SOLAR CELL

Taewoo Eom[1)], Jeong Eun Park[2)], Sang Yong Park[1)], Jung Hoon Park[1)], Jackson Bweupe[1)], Donggun Lim[1,2)]

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16:00-18:00 Room7+8+9 Area3

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FABRICATION OF INGAP SOLAR CELLS WITH HYDRIDE VAPOR PHASE EPITAXY

Kikuo Makita[1)], Ryuzi Oshima[1)], Akinori Ubukata[2)], Takeyoshi Sugaya[1)]

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3ThPo.117

ANNEALING EFFECTS ON GAAS/ITO/SI JUNCTIONS FABRICATED BY SURFACE- ACTIVATED BONDING

Tomoya Hara[1)], Tomoki Ogawa[1)], Jianbo Liang[1)], Kenji Araki[2)], Takefumi Kamioka[2)], Naoteru Shigekawa[1)]

[1)] Graduate School of Engineering, Osaka City University, [2)] Toyota Technological Insitute

3ThPo.118

OPTIMIZATION OF STATIC CPV FOR THE CAR-ROOF FOR MAXIMIZING SOLAR RESOURCES INCLUDING THE DIFFSED SUNLIGHT.

Taizo Masuda[1)], Kenji Araki[2)], Kan-Hua Lee[2)], Yasuyuki Ota[3)], Kensuke Nishioka[3)], Masafumi Yamaguchi[2)]

[1)] Toyota Motor Corporation, [2)] Toyota Technological Institute, [3)] University of Miyazaki

3ThPo.119

PROTOTYPE CONSTRUCTION, SIMULATION AND EVALUATION OF A SOLAR CPV-T HYBRID RECEIVER

Robert Hller[1)], Georg Stramair[1)], Robert Reinbrach[1)], Bernhard Kapeller[1)], Daniel Chemisana[2)]

[1)] Sustainable Energy Systems, University of Applied Science Upper Austria, [2)] University of Lleida

3ThPo.120

EVALUATION AND OPTIMIZATION OF WIDE ACCEPTANCE ANGLE CONCENTRATOR PHOTOVOLTAIC MODULE

Nawwar Ahmad[1)], Yasuyuki Ota[1)], Kenji Araki[2)], Kan-Hua Lee[2)], Masafumi Yamaguchi[2)], Kensuke Nishioka[1)]

[1)] Department of materials and informatics, University of Miyazaki, [2)] Toyota Technological Institute

3ThPo.121

QUANTITATIVE EVALUATION OF THERMAL RUNAWAY TOLERANCE IN SPACE SOLAR CELLS

Tetsuya Nakamura[1)], Taishi Sumita[1)], Mitsuru Imaizumi[1)]

[1)] Japan Aerospace Exploration Agency

3ThPo.122

STANDARDIZATION OF LOW-CONCENTRATION PHOTOVOLTAICS—TECHNICAL TERMS AND TESTING CONDITIONS

Kan-Hua Lee[1)], Kensuke Nishioka[2)], Kenji Araki[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute, [2)] University of Miyazaki

3ThPo.123

OPTIMIZATION OF SI BOTTOM SUBCELL FOR III-V ON SI WAFER BONDED MULTIJUNCTION SOLAR CELLS

Laura Vauche[1,2)], Elias Veinberg-Vidal[1,2)], Thibaut Desrues[1,3)], Marianne Coig[1,2)], Fréderic Milesi[1,2)], Vincent Rebeyrol[1,2)], Christophe Jany[1,2)], Pierre Mur[1,2)]

[1)] Univ. Grenoble Alpes, [2)] CEA LETI, [3)] CEA LITEN, INES

3ThPo.124

EFFICIENCY ENHANCEMENT OF InGaAs LASER CELL FOR 1080 nm LASER-BASED WIRELESS POWER TRANSMISSION OF UNMANNED AERIAL VEHICLE

Sang Hyun Jung[1)], Chang Zoo Kim[1)], Youngjo Kim[1)], Kangho Kim[1)], Hyun-Beom Shin[1)], Ho Kwan Kang[1)]

[1)] Korea Advanced Nano Fab Center

3ThPo.125

INVESTIGATE THE UNIFORMITY OF CONCENTRATED PV USING PRISMATIC STRUCTURE

Sheng-Hui Chen[1)], Ying-Tse Li[1)], Gui-Sheng Zeng[1)]

[1)] Department of Optics and Photonics, National Central University

3ThPo.126

RELIABILITY AND OUTDOOR PERFORMACE OF MICRO-CPV SYSTEM

Hwen-fen Hong[1)], Kai-Hsiang Yang[1)], Jia-Ruei Chang[1)], Chun-Yi Chen[1)], Zun-Hao Shih[1)], Yueh-Mu Lee[1)], Chen-Yen Fan,[1)]

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3ThPo.127

DUAL-JUNCTION GAAS PV CELLS FOR SMART STACKED MULTIJUNCTION SOLAR CELLS

Takeyoshi Sugaya[1)], Takeshi Tayagaki[1)], Kikuo Makita[1)], Ryuji Oshima[1)]

[1)] National Institute of Advanced Industrial Science and Technology (AIST)

3ThPo.128

FABRICATION AND TEST OF III-V/SI LATERAL HYBRID PHOTOVOLTAIC MODULE

Akihiro Abe[1)], Daisuke Sato[1)], Masaaki Baba[1)], Kan-Hua Lee[2)], Kenji Araki[2)], Masafumi Yamaguchi[2)], Noboru Yamada[1)]

[1)] Department of Mechanical Engineering, Nagaoka University of Technology, [2)] Toyota Technological Institute

3ThPo.129

52.7% CONVERSION EFFICIENCY OF SINGLE-JUNCTION GAAS SOLAR CELL FOR OPTICAL WIRELESS POWER TRANSMISSION USING LASER DIODE

Ryota Jomen[1)], Fumiaki Tanaka[1)], Toshiki Akiba[1)], Mitsutaka Ikeda[1)], Kosei Kiryu[1)], Mikiya Matsushita[1)], Hiroyasu Maenaka[1)], Pan Dai[2)], Shulong Lu[2)], Shiro Uchida[1)]

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3ThPo.130

IMPROVEMENT OF EFFICIENCY FOR 4-JUNCTION SOLAR CELL UNDER REAL SUNLIGHT

Hideo Teramoto[1)], Yoshiaki Ajima[1)], Yamato Kaneko[1)], Yuki Nakamura[1)], Ryota Jomen[1)], Pan Dai[2)], Shulong Lu[2)], Shiro Uchida[1)]

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3ThPo.131

REDUCED-LAYER-THICKNESS DESIGN OF INGAP/GAAS/INGAAS SOLAR CELLS USING LIGHT-TRAPPING TEXTURE MIRROR

Lin Zhu[1,2)], Anurag Reddy[3)], Kentaroh Watanabe[3)], Masakazu Sugiyama[3)], Yoshiaki Nakano[3)], Hidefumi Akiyama[1,2)]

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3ThPo.132

Ge CHEMICAL VAPOR DEPOSITION USING t-C4H9GeH4 FOR MULTIJUNCTION SOLAR CELLS

Tomohiko Hara[1)], Ryota Katayama[1)], Nobuaki Kojima[1)], Yoshio Ohshita[1)]

[1)] Advanced Science and Technology, Toyota Technological Institute

Thursday, November 16
16:00-18:00 Room7+8+9 **Area4**

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PUSH-COATING: EXTREMELY LOW-COST AND ECO-FRIENDLY PROCESS FOR POLYMER SOLAR CELL FABRICATION

shusei Inaba[1)], Varun Vohra[1)]

[1)] Department of Basic Science and Engineering, University of Electro-Communications

4ThPo.134

OUTPUT AND TRANSMITTED RADIATION EVALUATION OF ORGANIC PHOTOVOLTAIC MODULE WITH COMBINED FUNCTIONS

Hirata Youichi[1)], Iino Taichi[1)], Noboru Ohashi[1)], Yasuyuki Watanabe[1)], Cheng-Yeh Yu[1)]

[1)] Faculty of Engineering, Tokyo University of Science, SUWA

4ThPo.135

IDENTIFICATION OF MOLECULAR ORIENTATION IN BULK HETEROJUNCTION LAYER BY INFRARED REFLECTION ABSORPTION SPECTROSCOPY

Tatsuki Chikamatsu[1)], Tetsuya Taima[1,2,3)], Kohshin Takahashi[1,2)], Takayuki Kuwabara[1,2)], Makoto Karakawa[1,2,3)], Kohei Yamamoto[1)], Md. Shahiduzzaman[3)]

[1)] Graduate School of Natural Science and Technology, Kanazawa University, [2)] Research Center for Sustainable Energy and Technology (RSET), Kanazawa University, [3)] Institute for Frontier Science Initiative (InFiniti), Kanazawa University

4ThPo.136

EFFECT OF SOLVENT VAPOR ANNEALING ON ORGANIC PHOTOVOLTAICS WITH A NEW TYPE OF SOLUTION-PROCESSABLE OLIGOTHIOPHENE-BASED ELECTRONIC DONOR MATERIAL

Yuki Akiyama[1,2)], Hiroaki Tachibana[2)], Reiko Azumi[2)], Tetsuhiko Miyadera[2)], Masayuki Chikamatsu[2)], Tomoyuki Koganezawa[3)], Shuhei Yagi[1)], Hiroyuki Yaguchi[1)]

[1)] Saitama University, [2)] National Institute of Advanced Industrial Science and Technology (AIST), [3)] Japan Synchrotron Radiation Research Institute (JASRI)

4ThPo.137

a-DIKETONE-TYPE PHOTOPRECURSORS OF MOLECULAR P-TYPE SEMICONSUCTORS: APPLICATION IN ORGANIC PHOTOVPLTAICS AND EVALUATION OF SUBSTITUENT IMPACT

Hiroko Yamada[1)], Naoto Nagami[1)], Kengo Terai[1)], Mitsuharu Suzuki[1)]

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4ThPo.138

SINGLE CRYSTAL ORGANIC PHOTOVOLTAIC CELLS USING LATERAL ELECTRON TRANSPORT

Mitsuru Kikuchi[1,3)], Kenichiro Takagi[2)], Hiroyoshi Naito[2,3)], Masahiro Hiramoto[1,3)]

[1)] Institute for Molecular Science, [2)] Osaka Prefecture University, [3)] NEDO

4ThPo.139

HOLE- AND ELECTRON-ONLY TRANSPORT IN RATIO-CONTROLLED ORGANIC CO- DEPOSITED FILMS OBSERVED BY IMPEDANCE SPECTROSCOPY

Naoto Shintaku[1,2,4)], Seiichiro Izawa[1,2)], Kennichiro Takagi[3,4)], Hiroyoshi Naito[3,4)], Masahiro Hiramoto[1,2,4)]

[1)] SOKENDAI (The Graduate University for Advanced Studies), [2)] Instisute for Molecular Science, [4)] NEDO

4ThPo.140

LIGHTWAVE MANIPULATION IN ORGANIC SOLAR CELLS BY INTEGRATING MULTIPLE OPTICAL NANOPATTERNS WITH VARIOUS PATTERN PITCH

Soo Won Heo[1)], Keisuke Tajima[1,2)]

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4ThPo.141

MODULATING ORBITAL ENERGY LEVELS OF TETRABENZOPORPHYRIN TOWARD HIGH-PERFORMANCE ORGANIC SOLAR CELLS

Eunjeong Jeong[1)], Kohtaro Takahashi[1)], Mitsuharu Suzuki[1)], Hiroko Yamada[1)]

[1)] Graduate School of Materials Science, Nara Institute of Science and Technology

4ThPo.142

DETERMINATION OF BIMOLECULAR RECOMBINATION COEFFICIENTS IN BULK HETEROJUNCTION SOLAR CELLS BY MEANS OF IMPEDANCE SPECTROSCOPY

Tatsuya Nunobiki[1)], Makoto Takada[1)], Takashi Nagase[1,2)], Takashi Kobayashi[1,2)], Naito Hiroyoshi[1,2)]

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4ThPo.143

REAL-TIME X-RAY DIFFRACTION ANALYSIS FOR SOLVENT VAPOR ANNEALING PROCESS OF SMALL-MOLECULE/ FULLERENE FILMS

Tetsuhiko Miyadera[1)], K. Arai[1,2)], T. Koganezawa[3)], Y. Akiyama[1,2)], H. Tachibana[1)], Y. Yoshida[1)], M. Chikamatsu[1)], S. Yagi[2)], H. Yaguchi[2)]

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4ThPo.144

AGRICULTURAL SENSOR SYSTEM USING SEE-THROUGH ORGANIC THIN FILM SOLAR MODULES

Noboru Ohashi[1)], Wakana Tsutsumi[2)], Masayuki Chikamatsu[2)], Yuji Yoshida[2)], Yasuyuki Watanabe[1)]

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4ThPo.145

ORGANIC SOLLER CELLS USING N-TYPE ORGANIC SEMICONDUCTORS WITH A PHOTOCONVERTIBLE UNIT

Masaki Yamato[1,2,4)], Kazuki Kawajiri[3)], Takahiro Kawanoue[3)], Yuji Yamaguchi[1,2)], Mitsuharu Suzuki[3)], Hiroko Yamada[3)], Ken-ichi Nakayama[1,2,4)]

[1)] Department of Organic Materials Science, Yamagata University, [2)] Research Center for Organic Electronics, Yamagata University, [3)] Graduate School of Materials Science, Nara Institute of Science and Technology, [4)] Department of Material and Life Science, Osaka University

4ThPo.146

IMPS/IMVS MEASUREMENT IN THIN-FILM ORGANIC SOLAR CELLS

Kazuhiro Tanaka[1,2)], Tatsuya Okura[1)], Chiho Katagiri[1,2)], Tsukasa Yoshida[1)], Ken-ichi Nakayama[1,2)]

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4ThPo.147

EPITAXIAL GROWTH OF C60 ON ORGANIC SINGLE CRYSTAL SUBSTRATES

Ryohei Tsuruta[1)], Yuta Togami[1)], Kento Imai[1)], Yuta Mizuno[2)], Soichiro Yamanaka[1)], Koki Yoshida[1)], Toshiaki Mori[1)], Tomoyuki Koganezawa[3)], Takuya Hosokai[4)], Yasuo Nakayama[1)]

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4ThPo.148

POLYOL - MEDIATED SYNTHESIS OF HIERARCHICAL Cu2ZnSnSe4 (CZTSe) NANOPARTICLES FOR LOW- COST SOLAR CELLS

Sridharan Moorthy Babu[1)], Charles Imala Mary[1)], Soosaimanickam Ananthakumar[1)], Muthu Senthilkumar[1)]

[1)] Crystal Growth Centre, Anna University

4ThPo.149

COLORFUL POLYMER SOLAR CELLS EMPLOYING ENERGY TRANSFER DYE MOLECULE

Jaemin Kong[1)], Megan Mohadjer Beromi[2)], Marina Mariano[1)], Teng Hooi Goh[1)], Francisco Antonio[1)], Nilay Hazari[2)], Andre Taylor[1)]

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Thursday, November 16
16:00-18:00 Room7+8+9 Area5

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HIGH EFFICIENCY METHYL AMMONIUM LEAD HALIDE PEROVSKITE SOLAR CELL WITH LOW DEFECTS

Sk Md Iftiquar[1)], Junhee Jung[2)], Junsin Yi[1)]

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5ThPo.151

EFFECT OF TIO2 ELECTRON TRANSPORT LAYERS IN PEROVSKITE SOLAR CELLS

Naoki Ueoka[1)], Takeo Oku[1)], Atsushi Suzuki[1)], Hiroki Sakamoto[3)], Masahiro Yamada[3)], Satoshi Minami[4)], Shinsuke Miyauchi[4)], Shinichiro Tsukada[4)]

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PHOTOVLTAIC PEROFORMANCE OF PEROVSKITE SOLAR CELLS DOPED WITH CS

Naoki Ueoka[1)], Takeo Oku[1)], Atsushi Suzuki[1)]

[1)] Department of Materials Science, The University of Shiga Prefecture

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LIGHT AND ELECTRIC FIELD INDUCED DEGRADATION OF PEROVSKITE SOLAR CELLS

Soohyun Bae[1)], Sang-Won Lee[1)], Kyung Jin Cho[1)], Jae Keun Hwang[1)], Yoonmook Kang[1)], Hae-Seok Lee[1)], Donghwan Kim[1)]

[1)] Korea University

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RESEARCH ON THE OPTICAL AND ELECTRICAL CHARACTERISTICS OF SOLUTION- PROCESSED TIO2 LAYER FOR THE APPLICATION OF PEROVSKITE SOLAR CELLS

JungYup Yang[1)], Wooil Jung[1)], Hyunmo Koo[1)], Jungseok Oh[1)]

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EFFECT OF TIO2-PHOTOELECTODES COMPOSITION ON THE PERFORMANCE OF PEROVSKITE SOLAR CELLS UNDER LOW LIGHT INTENSITY CONDITIONS

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RELIABILITY EVALUATION OF PEROSKITE SOLAR CELLS BY LUMINESCENCE METHOD

Tzu-Huan Cheng[1)], Shih-Hung Lin[2)], Sheng-Hsiung Yang[3)]

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RESEARCH ON CARRIER TRANSPORT LAYERS OF METAL OXIDE SEMICONDUCTORS FOR PEROVSKITE SOLAR CELLS

JungYup Yang[1)], Wooil Jung[1)], Hyunmo Koo[1)], JungSeok Oh[1)], Dukjoon Cha[1)], Soohyun Bae[2)], Sangwon Lee[2)], Yoonmook Kang[3)]

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EFFECTS OF ELEMENT ADDITION TO CH3NH3PBI3 PHOTOVOLTAIC DEVICES

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Hydrogenated TiO2 Thin Film for Accelerating Electron Transportation in Planar Perovskite Solar Cells

Xin Yao[1,2)], Junhui Liang[1,2)], Yi Ding[1,2)], Ying Zhao[1,2)], Xiaodan Zhang[1,2)], Biao Shi[1,2)], Di Liu[1,2)], Lin Fan[1,2)], Shanzhen Zhao[1,2)], Changchun Wei[1,2)], Dekun Zhang[1,2)], Baozhang Li[1,2)]

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Efficiency Increasing in Inverted Perovskite Solar Cells by TiCl4 Surface Treatment of (Ni,Li)O Hall Transport Layers

Takashi Nishihara[1)], Shinya Fujimura), Michio Suzuka[1)], Takayuki Negami[1)]

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SEVERE MORPHOLOGICAL DEFORMATION OF SPIRO-OMETAD IN PEROVSKITE SOLAR CELLS AT HIGH TEMPERATURE: CAUSES AND CONSEQUENCES

Ajay Kumar Jena[1)], Masashi Ikegami[1)], Tsutomu Miyasaka[1)]

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APPLICATION OF SrCuSeF AND ITO BILAYER OHMIC TUNNEL JUNCTION AS HOLE TRANSPORT LAYER FOR PEROVSKITE SOLAR CELLS

Jingo Tsuji[1)], Kenji Miki[1)], Kako Kawakita[1)], Atsumi Kinoshita[1)], Takahiro Wada[1)], Yoshifumi Aoi[1)]

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CHARGE TRAPS IN LEAD-HALIDE PEROVSKITES WITH DIFFERENT GRAIN SIZES

HYUNG DO KIM[1)], Yasunari Tamai[1)], Hideo Ohkita[1)]

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NOVEL HOLE TRANSPORT MATERIALS WITH TETRATHIAFULVALENE CORE FOR EFFICIENT PEROVSKITE SOLAR CELLS

Ryuji Kaneko[1,2)], Guohua Wu[2)], Kosuke Sugawa[2)], Ashraful Islam[1)], Joe Otsuki[2)]

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TRIPHENYLAMINE DERIVATIVES FOR INTERFACE BETWEEN PEROVSKITE AND HOLE TRANSPORT MATERIAL IN PEROVSKITE SOLAR CELLS

Takashi Funaki[1)], Nobuko Onozawa-Komatsuzaki[1)], Takurou N. Murakami[1)], Masayuki Chikamatsu[1)]

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TIN OXIDE ELECTRON-TRANSPORT LAYER PREPARED BY SPRAY PYROLYSIS FOR HYSTERESIS-LESS ORGANO-METAL-HALIDE PEROVSKITE SOLAR CELLS

Hsin-Wei Chen[1)], Takeru Bessho[2)], Zeguo Tang[2)], Hiroshi Segawa[1,2)]

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FABRICATION OF EFFICIENT PEROVSKITE SOLAR CELLS USING A COMPLEX OF CH3NH3PBI3(DMF) AS A KEY PRECURSOR BY A SOLUTION PROCESS

Masashi Ozaki[1)], Alwani Rafieh[1)], Naoki Maruyama[1)], Ai Shimazaki[1)], Mina Jung[1)], Yumi Nakaike[1)], Tomoko Aharen[1)], Takahiro Sasamori[1)], Norihiro Tokitoh[1)], Yasujiro Murata[1)], Atsushi Wakamiya[1)]

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THE ELECTRICAL AND OPTICAL CHARACTERIZATIONS OF CH3NH3PBI3-XCLX FILMS BY VACUUM EVAPORATION

Yuki Sakurai[1)], Akira Nakanishi[1)], Shinsuke Miyajima[1)]

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ECO-FRIENDLY BISMUTH HALIDE, AG-BI AND CU-BI BASED LIGHT ABSORBING MATERIALS FOR LEAD FREE PEROVSKITE SOLAR CELLS

Ashish Kulkarni[1)], Masashi Ikegami[1)], Tsutomu Miyasaka[1)]

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IMPROVEMENT IN THE ELECTRICAL PROPERTIES OF PEROVSKITE SOLAR CELL WITH A MESOPOROUS ALUMINA INTERLAYER BETWEEN HTL AND ETL

Seiya Sakakibara[1)], Tetsuya Kaneko[1)], Masao Isomura[1)]

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All Low temperature (< 150oC) processed high efficiency and stable flexible perovskite solar cells

Trilok Singh[1)], Masashi Ikegami[1)], Tsutomu Miyasaka[1)]

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Substrate Effect on Ultra-Thin Hydrogenated Amorphous Silicon Solar Cells

Jia Fang[1,2,3,4)], Baojie Yan[1,2,3,4)], Tiantian Li[1,2,3,4)], Ying Zhao[1,2,3,4)], Xiaodan Zhang[1,2,3,4)], Baojie Yan[1,2,3,4)], Changchun Wei[1,2,3,4)], DekunZhang[1,2,3,4)], Baozhang Li[1,2,3,4)], Qian Huang[1,2,3,4)], Xinliang Chen[1,2,3,4)], Guangcai Wang[1,2,3,4)]

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BAND GAP ENGINEERING OF LEAD-FREE PEROVSKITES WITH SOLVENTS

Sridharan Moorthy Babu[1)], M. Pandiyarajan[1)], G. Mano Balaji[1)], Subashchandran Shanthi[1)]

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FABRICATION AND CHARACTERIZATION OF PEROVSKITE-TYPE SOLAR CELLS ADDED WITH POLYSILANES

Junya Nomura[1)], Takeo Oku[1)], Atushi Suzuki[1)], Sakiko Fukunishi[2)], Satoshi Minami[2)], Shinichiro Tsukada[2)]

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ACCELERATED LIFETIME TESTING OF ORGANIC-INORGANIC PEROVSKITE SOLAR CELLS ENCAPSULATED BY LOW COST POLYISOBUTYLENE BASED POLYMER

Lei Shi[1)], Mark Keevers[1)], Xiaojing Hao[1)], Anita Ho-Baillie[1)], Trevor Young[1)], Martin Green[1)]

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EFFECTS OF CATIONIC SURFACTANTS ADDITION TO CH3NH3PBI3 SOLAR CELLS

Junya Nomura[1)], Yuya Ohishi[1)], Atsushi Suzuki[1)], Takeo Oku[1)]

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LIGHT MANAGEMENT FOILS FOR BOOSTING PEROVSKITE

SOLAR CELL PERFORMANCE

Marko JOST[1,2], Steve ALBRECHT[2], Benjamin LIPOVSEK[1], Janez KRC[1], Lars KORTE[3], Bernd RECH[3], Marko TOPIC[1]

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INFLUENCE OF CHARGE TRANSPORT AND DEFECTS ON THE PERFORMANCE OF MESOSTRUCTURED AND PLANAR PEROVSKITE SOLAR CELLS

Miloš Petrović [1,2], Ye Tao[1], Vijila Chellapan[2], Seeram Ramakrishna[1]

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SILICON PHOTOVOLTAIC CELLS COUPLED WITH SOLAR-PUMPED LASERS

Noboru Yamada[1], Tadashi Ito[1], Yasuhiko Takeda[1], Hiroshi Ito[2], Tomoyoshi Motohiro[2]

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Half-Gaussian Distributed Bragg Reflector for back reflection in solar cells

Tsong-Sheng Lay[1], Chen-Yi Su[1]

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STRUCTURAL AND OPTICAL ANALYSIS OF SPUTTERED BASI2 THIN FILM

Miro Zeman[1], Yilei Tian[1], Robin Vismara[1], Steve van Dooren[1], Pavol Šutta[2], Ľubomír Vančo[3], Marian Veselý[3], Peter Vogrinčič[3], Olindo Isabella[1]

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OPTICAL TRANSITION AND CARRIER TRANSPORT IN TYPE-II HETEROSTRUCTURES OF HIGHLY DENSE InAs QUANTUM DOTS ON GaAsSb/GaAs

Ryosuke Suzuki[1], Ryo Sugiyama[1], Tomah Sogabe[2], Koichi Yamaguchi[1]

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TWO-STEP PHOTO-EXCITATED ELECTRONS WITH EXTREMELY-LONG LIFETIME IN INTERMEDIATE-BAND SOLAR CELLS USING DOT-IN-WELL STRUCTURE

Shigeo Asahi[1], Haruyuki Teranishi[1], Toshiyuki Kaizu[1], Takashi Kita[1]

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LIGHT INTERFERENCE INTEGRATED DEVICE SIMULATION IN THIN FILM InAs/GaAs QUANTUM DOT SOLAR CELL

Tomah Sogabe[1,2], Mitsuki Mori[3], Katsuyoshi Sakamoto[2], Koichi Yamaguchi[2], Yoshitaka Okada[3]

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OVERCOMING THE POOR SHORT WAVELENGTH SPECTRAL RESPONSE OF SILICON NANOWIRE SOLAR CELLS VIA PHOSPHORESENCT ENERGY DOWNSHIFTING

Kangmin Lee[1], Hyun-Tak Kim[2], Wonjoo Jin[1], Tae-Hyuk Kwon[2], Kwanyong Seo[1]

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FIRST-PRINCIPLES STUDY OF OPTICAL TRANSITIONS IN GALLIUM ARSENIDE:NITROGEN DELTA-DOPED SUPERLATTICES

Hiroki Yoshikawa[1], Shuhei Yagi[1], Hiroyuki Yaguchi[1]

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DEVELOPMENT OF PREFERRED ORIENTATION IN EVAPORATED BASI2 FILMS ON SI(100) BY CONTROLLING THE NEAR-INTERFACE STRUCTURE

Kosuke O. Hara[1], Chiaya Yamamoto[1], Junji Yamanaka[1], Keisuke Arimoto[1], Kiyokazu Nakagawa[1], Noritaka Usami[2]

[1] University of Yamanashi, [2] Nagoya University

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POLYCRYSTALLINE BASI2 THIN FILMS FORMED BY PULSED LAYER DEPOSITION FOR SOLAR CELLS APPLICATION

Weijie Du[1)], Rui Du[1)], Guoliang Ma[1)], Yiwen Zhang[1)], Takashi Suemasu[2)]

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INFLUENCE OF NITROGEN ATOMIC ARRANGEMENT IN GAASN ALLOYS ON BAND GAP ENERGY

Kazuki Miyajima[1)], Shuhei Yagi[1)], Yasushi Shoji[2)], Yoshitaka Okada[2)], Hiroyuki Yaguchi[1)]

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DRIFT-DIFFUSION ANALYSIS ON QUANTUM EFFICIENCY OF QUANTUM-DOT INTERMEDIATE-BAND SOLAR CELLS

Katsuhisa Yoshida[1)], Yoshitaka Okada[1)]

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RISKS AND OPPORTUNITIES IN CHALLENGING NEW BANDGAP MATERIALS FOR INCREASING NUMBER OF JUNCTIONS – PROBABILITY STUDY

Kenji Araki[1)], Kan-Hua Lee[1)], Masafumi Yamaguchi[1)]

[1)] Toyota Technological Institute

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INFLUENCE OF BARRIER LAYER'S HEIGHT ON THE PERFORMANCE OF Si QUANTUM DOTS SOLAR CELLS

Kouhei Kitazawa[1)], Ryushiro Akaishi[1)], Satoshi Ono[1)], Isao Takahashi[1)], Noritaka Usami[1)], Yasuyoshi Kurokawa[1)]

[1)] Graduate School of Engineering, Nagoya University

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DEVICE DESIGNS AND CHARACTERIZATION OF INGAP-BASED INP QUANTUM DOT SOLAR CELLS

Taketo Aihara[1)], Takeshi Tayagaki[1)], Yuki Nagato[2)], Yoshinobu Okano[2)], Takeyoshi Sugaya[1)]

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FABRICATION OF LIGHT TRAPPING STRUCTURE BY SELECTIVE ETCHING OF THIN Si SUBSTRATES MASKED WITH A Ge DOTS LAYER

Atsushi Hombe[1)], Yasuyoshi Kurokawa[1)], Seimei Akagi[2)], Yuzo Yamamoto[2)], Dmitry Yurasov[3)], Alexey Novikov[3)], Noritaka Usami[1)]

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ELECTRICAL CHARACTERIZATION OF Cl-DOPED ZnTeO-BASED INTERMEDIATE BAND SOLAR CELLS

Kento Matsuo[1)], Shuji Tsutsumi[1)], Tooru Tanaka[1)], Katsuhiko Saito[1)], Qixin Guo[1)], Kin Man Yu[2)], Wladek Walukiewicz[3,4)]

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MULTI-PROPERTY AND MULTI-SCALE COMPUTATIONAL MATERIAL OPTIMIZATION OF SOLAR CELL DEVICE

Ahmer AB Baloch[1)], H. Al Salman[2)], M. I. Hossain[1)], F. El-Mellouhi[1)], N. Tabet[1)], F. Alharbi[1)]

[1)] Hamad bin Khalifa University, [2)] King Abdul-Aziz City for Science & Technology

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SYNTHESIS OF GRAPHENE ON SILICON DIRECTLY AT LOW TEMPERATURE FOR SCHOTTKY JUNCTION SOLAR CELLS

Sudip Adhikari[1)], Rupesh Singh[1)], Hideo Uchida[1)], Mikio Yasubayashi[1)], Masayoshi Umeno[1)]

[1)] Chubu University

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CHARACTERIZATION OF GASB QUANTUM DOT SOLAR CELLS BY CAPACITANCE MEASUREMENTS

Takeshi Noda[1)], Martin Elborg[1)], Takaaki Mano[1)], Takuya Kawazu[1)]

[1)] National Institute for Materials Science

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HETEROJUNCTION CARBON BASED SOLAR CELLS

Hideo Uchida[1)], Sudip Adhikari[1)], Masayoshi Umeno[1)]

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NON-DESTRUCTIVE HOMOGENEITY MAPPING OF ETHYLENE VINYL ACETATE CROSSLINK DEGREE IN COOPER INDIUM GALLIUM SELENIDE MODULE

Chin Lien[1)], Cho-Fan Hsieh[1)], Hung-Sen Wu[1)], Teng-Chun Wu[1)]

[1)] Photovolatic Metriligy Laboratory, Center for Measurement Standard, Industrial Technology Research Institute

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MEAN SURFACE-PRESSURE PATTERN ON PHOTOVOLTAIC MODULE FOR NON- UNIFORM DYNAMIC MECHANICAL LOAD TEST

Shu-Tsung Hsu[1)], Hung-Sen Wu[1)], Chin Lien[1)]

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STRESS-FREE INTERCONNECTION OF CRYSTALLINE SILICON SOLAR CELLS

Dong-Youn Shin[1)], Hae Wook Chung[1)], Hyung-Jun Song[2)], Jeong In Lee[2)]

[1)] Department of Graphic Arts Engineering, Pukyong National University, [2)] Korea Institute of Energy Research

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INVESTIGATION AND ESTIMATION OF UV IRRADIATION DOSAGE TO BACK SIDE OF RACK MOUNTED PHOTOVOLTAIC MODULES

Yoshiyuki Kobayashi[1)], Hideyuki Morita[1)], Kentaro Mori[1)], Atsushi Masuda[2)]

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EXPLORING PID TESTING PROCEDURES OF CIGS PV MODULES

Keiichiro Sakurai[1)], Hiroshi Tomita[2)], Darshan Schmitz[2)], Shuuji Tokuda[2)], Kinichi Ogawa[1)], Hajime Shibata[1)], Atsushi Masuda[1)]

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DEGRADATION ANALYSIS OF MONOCRYSTALLINE-SILICON PHTOTOVOLTAIC MODULES EXPOSED OVER 22 YEARS IN A HOT-HUMIDITY ENVIRONMENT

Huili Han[1,2)], Xian Dong[2)], Haiwen Lai[1)], Bingzhi Li[1)], Huan Yan[1)], Kai Zhang[2)], Hui Shen[1)],

[1)] Sun Yat-Sen University, China, [2)] ShunDe SYSU Institute for Solar Energy, China

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ANALYSIS OF MICRO-CRACKS AND DELAMINATION OF 10-YEAR AGED PV MODULES IN HOT-HUMID REGION

Xian Dong[1)], Zhouhua Wu[2)], Yan He[2)], Kai Zhang[1)], Hui Shen[2)]

[1)] ShunDe SYSU Institute for Solar Energy, [2)] Sun Yat-Sen University

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LIFETIME IMPROVEMENT OF TIN FILM SENSOR FOR DETECTING ACETIC ACID PRODUCED IN PHOTOVOLTAIC MODULES

Ryo Hamaoka[1)], Tomohiro Itayama[1)], Hideaki Nagasaki[1)], Kentarou Iwami[1)], Satoru Takemoto[1)], Chizuko Yamamoto[2)], Yukiko Hara[2)], Atsushi Masuda[2)], Norihiro Umeda[1)]

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POTENTIAL-INDUCED DEGRADATION IN N-TYPE C-SI PHOTOVOLTAIC MODULES BY OUTDOOR EXPOSURE

Minoru Akitomi[1)], Kohjiro Hara[1)], Yasuo Chiba[1)], Atsushi Masuda[1)]

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EFFECTS OF HYGROTHERMAL ENVIRONMENT ON PID ACCELERATION FOR CRYSTALLINE SILICON PHOTOVOLTAIC MODULES

Yasushi Tachibana[1)], Takeshi Toyoda[1)], Toshiharu Minamikawa[1)], Yukiko Hara[2)], Atsushi Masuda[2)]

[1)] Industrial Research Institute of Ishikawa, [2)] National Institute of Advanced Industrial Science and Technology

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INFLUENCE OF ENVIRONMENTAL STRESS FACTORS INCLUDING LIGHT IRRADIATION ON PHOTOVOLTAIC MODULE DEGRADATION

Tomoko Aoki[1)], Yukiko Hara[1)], Atsushi Masuda[1)]

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BUSBAR CURRENT ESTIMATION OF PV MODULE USING

MAGNETIC SENSOR

Kenta Onohara[1)], Marjila Burhanzoi[1)], Teppei Noguchi[1)], Tomoaki Ikegami[1)], Shinji Kawai[2)]

[1)] Kumamoto University, [2)] Industrial Technology Research Center of SAGA

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PV MODULE DIAGNOSIS BY MEASURING MAGNETIC FLUX DENSITY ON THE MODULE SURFACE

Marjila Burhanzoi[1)], Kenta Onohara[1)], Fumiaki Mitsugi[1)], Tomoaki Ikegami[1)], Shinji Kawai[2)]

[1)] Kumamoto University, [2)] Industrial Technology Research Center of SAGA

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MAXIMIZING MODULE RELIABILITY PERFORMANCE WITH POLYOLEFIN ENCAPSULANTS

Wayne Ma[1)]

[1)] Dow Chemical (China) Investment Company

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THE PERFORMANCE ANALYSIS OF FIELD EXPOSURE AND DAMP HEAT TEST FOR FLEXIBLE CIGS PHOTOVOLTAIC MODULE

Hyun-A Kim[1)], Jehyun Baeg[1)], Sunmook Lee[1)]

[1)] Korea Conformity Laboratories

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MEASURING ACETIC ACID TRANSMISSION RATES OF PV BACKSHEETS

Gernot Oreski[1)], Antonia Mihaljevic[1)], Gabriele C. Eder[2)], Yuliya Voronko[2)]

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AN ANALYSIS ON CURRENT FLOW AND THERMAL CHARACTERISTIC OF PV MODULE WITH DAMAGED BYPASS DIODE

Woo Gyun Shin[1)], Suk Hwan Go[1)], Young Chul Ju[1)], Hyung Jun Song[1)], Gi Hwan Kang[1)]

[1)] Photovoltaic Laboratory, Korea Institute of Energy Research

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CELL STRING-FREE CONDUCTIVE PASTE BASED SOLDERING FOR C-SI PV MODULE ASSEMBLING

Hyung-Jun Song[1)], Woo Gyun Shin[1)], Young Chul Ju[1)], Suk Hwan Go[1)], Hee-eun Song[1)], Gi Hwan Kang[1)]

[1)] Photovoltaic Labratory, Korea Institute of Energy Research

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ONSITE ELECTROLUMINESCENCE MEASUREMENT OF PV MODULE USING CMOS CAMERA

Takuya Fujiwara[1)], Shunsuke Nakamura[1)], Tomoaki Ikegami[1)]

[1)] Kumamoto University

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INVESTIGATION OF IMBRICATED SOLAR CELLS FOR HIGH POWER

Hongsub Jee[1)], Chaehwan Jeong[1)]

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VISUALIZATION OF TEMPORAL PH DISTRIBUTION IN PV MODULES DURING DAMP HEAT TEST USING A PH-SENSITIVE FLUORESCENT DYE SENSORS

Kentaro Iwami[1)], Hideaki Nagasaki[1)], Tomohiro Itayama[1)], Chizuko Yamamoto[2)], Yukiko Hara[2)], Atsushi Masuda[2)], Norihiro Umeda[2)]

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OBSERVATION OF REVERSE BIASED ELECTROLUMINESCENCE FROM LOCAL SHUNT OF P-TYPE C-SI SOLAR CELL

Hiroki Yoshida[1)], Takuya Shichi[1)], Fumitaka Ohashi[1)], Ruben Jeroimo Freitas[1)], Yukiko Hara[2)], Atsushi Masuda[2)], Shuichi Nonomura[1)]

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ELECTROCHEMICAL RECYCLING OF PHOTOVOLTAIC MODULE

Jong Won Ko[1)], Se Jin Park[1)], Hyomin Park[1)], Soohyun Bae[1)], Yoonmook Kang[1)], Hae-Seok Lee[1)], Donghwan Kim[1)]

[1)] Korea University

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EFFECT OF VISCOELASTICITY OF EVA ENCAPSULANTS ON PHOTOVOLTAIC MODULE SOLDER JOINT DEGRADATION DUE TO THERMOMECHANICAL FATIGUE

Jiang Zhu[1)], Michael Owen-Bellini[1)], Daniel Montiel-Chicharro[1)], Thomas R. Betts[1)], Ralph Gottschalg[1)]

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RAPID SATURATION OF POTENTIAL-INDUCED DEGRADATION IN N-TYEP C-SI PHOTOVOLTAIC MODULES

Seira Yamaguchi[1)], Kyotaro Nakamura[2)], Atsushi Masuda[3)], Keisuke Ohdaira[1)]

[1)] Japan Advanced Institute of Science and Technology, [2)] Meiji University, [3)] National Institute of Advanced Industrial Science and Technology

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RELATION OF ELECTROLUMINESCENCE INTENSITY AND POTENTIAL INDUCED DEGRADATION TEST TIME ON P-TYPE MONOCRYSTALLINE SILION PHOTOVOLTAIC MODULE

Takuya Oshima[1)], Daisuke Kobayashi[1)], Mohammad Aminul Islam[1)], Yasuaki Ishikawa[1)], Yukiharu Uraoka[1)]

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FAILURE MODES EVALUATION OF PV MODULES UNDER DIFFERENT CLIMATIC REGIONS IN CHINA

Hailing Li[1)], Fang Iv[1)]

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POTENTIAL-INDUCED DEGRADATION BEHAVIOR OF N-TYPE REAR-EMITTER C-Si PHOTOVOLTAIC MODULES PRESTRESSED IN DAMP-HEAT TESTS

Yutaka Komatsu[1)], Seira Yamaguchi[1)], Atsushi Masuda[2)], Keisuke Ohdaira[1)]

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LITETIME ESTIMATION OF SILICON PHOTOVOLTAIC MODULE USING LASER-BASED DIAGNOSIS TECHNOLOGY

Yasuaki Ishikawa[1)], Mohammad Aminul Islam[1)], Yasushi Takagi[2)], Hirotaka Iida[2)], Hidenari Nakahama[2)]

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INDOOR TESTS TO CONFIRM SEA WATER EFFECTS ON THE PERFORMANCE OF PHOTOVOLTAIC MODULE TO BE INSTALLED BENEATH THE SALT FARM

Cheolhyun Lim[1)], Hyunki Kim[1)], Woosuk Chang[1)], Changheon Kim[1)], Sukho Lee[1)], Bong-suck Kim[2)], Seung-min Lee[2)], Moon-Seon Jeong[2)]

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PERFORMANCE TEST AND ANALYSIS OF PV MODULES AFFECTED BY POTENTIAL INDUCED DEGRADATION

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SMALL PURE SINE GRID/STANDALONE INVERTER USING PLL SYNC TECNIQUE WITH DSPIC MICROCONTROLLER

worrajak muangjai[1)], Kosol Oranpiroj[1)], Wichan Jantee[1)], Piched Tanin[2)]

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A COMPACT PHOTOVOLTAIC POWER GENERATION SYSTEM BUILT WITH SUB-KW CLASS SILICON CARBIDE INVERTER AND SPHERICAL SILICON SOLAR CELLS

Yuji Ando[1)], Takeo Oku[1)], Masashi Yasuda[2)], Kazufumi Ushijima[3)], Mikio Murozono[4)]

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PV module temperature measurement procedure in monitoring PV system and commissioning tests

Hiromi Tobita[1)], Hirofumi Shinohara[1)]

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8ThPo.234

INTERPOLATION METHOD FOR MISSING DATA OF MEASUREMENT IN MEGA SOLAR POWER PLANT USING WAVELET TRANSFORMS

Shigeomi Hara[1], Makoto Kasu[1]

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Establishment of Thermal Model of Ni-MH Battery under Low Temperature - Surface Temperature Characteristics by Fluctuating Charge and Discharge Current Examination -

Shunta Sasaya[1], Shogo Nishikawa[1]

[1] Nihon University

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Modeling of Ni-MH Battery for Syowa Base Voltage Reply Model Under Low Temperature(part 2)

Terumasa Asaka[1], Shogo Nishikawa[1]

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DESIGN SIMULATION AND EXPERIMENTAL PERFORMANCE OF DEEPWELL PV PUMPING SYSTEM FOR DOMESTIC APPLICATIONS IN THAILAND

Teerasak Somsak[1], Wichai Tachamahaphan[2], Nuttaphon Tiwongsa[2], Nopporn Patcharaprakiti[2], Jutturit Thongporn[2]

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SUBSECOND INTERVAL MEASUREMENTS OF OUTDOOR-OPERATED MEGA SOLAR POWER PLANT

Shigeomi Hara[1], Makoto Kasu[1]

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VALIDATION OF DIRECT NORMAL SPECTRAL IRRADIANCE MEASUREMENTS FROM ROTATING SHADOWBAND SPECTRORADIOMETER

Mário Pó[1], Kees Hoogendijk[1], Will Beuttell[1], Kazunori Shibayama[1], Eiji Takeuchi[1], Toshikazu Hasegawa[1]

[1] EKO Instruments Co., Ltd.

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SUB SECOND IRRADIANCE MEASUREMENTS WITH A FAST THERMOPILE PYRANOMETER

Mário Pó[1], Kees Hoogendijk[1], Will Beuttell[1], Akihito Akiyama[1], Toshikazu Hasegawa[1]

[1] EKO Instruments Co., Ltd.

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DEVELOPMENT OF PHOTOVOLTAIC THERMOELECTRIC PORTABLE DRINKING WATER SYSTEM: FLOOD CRISIS

Jutturit Thongpron[1], Chana Uttasilp[1], Nopporn Patcharaprakiti[1], Teerasak Somsak[3]

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PERFORMANCE EVALUATION OF GAN MPPT BY TRANSIENT CHARACTERISTICS

Masayoshi Hamanaka[1], Takanori Matsuyama[2], Kazuto Yukita[1], Toshiro Matsumura[1], Yasuyuki Goto[1]

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DEVELOPMENT OF A HYPERSPECTRAL DEVICE FOR SOLAR RESOURCE ASSESSMENT

Jose Mario Po[1], Erik Haverkamp[2], Kees Hoogendijk[1], Toshikazu Hasegawa[1]

[1] EKO Instruments Co., Ltd, [2] Radboud University

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AN ENERGY EFFICIENCY BETWEEN R22 AC COMPRESSOR AND R410 BLDC ROTARY COMPRESSOR OF SPLIT TYPE SOLAR AIR CONDITIONER

Nopporn Patcharaprakiti[1], Weerachat Kuadkeaw[1], Teerasak Somsak[1], Jutturit Thongpron[1]

[1] Electrical Engineering, Rajamangala University of Technology Lanna

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A SULFUR REMOVAL OF LIGNITE COAL WASHED WATER BY SOLAR POWERED ELECTROCOAGULATION SYSTEM

Nopporn Patcharaprakiti[1], Panuwat Tipwangmek[1], Teerasak Somsak[1], Jutturit Thongpron[1]

[1] Electrical Engineering, Rajamangala University of Technology Lanna

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NIGHTTIME SOC CONTROL METHOD IN A RESIDENTIAL AREA WITH A LARGE PENETRATION OF PV SYSTEMS WITH STORAGE BATTERIES

Junya Matsunaga[1)], Shinji Wakao[1)]

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STORAGE BATTERY MANAGEMENT IN PHOTOVOLTAIC SYSTEMS BASED ON PREDICTION INTERVAL ESTIMATION OF ELECTRIC POWER DEMAND

Mihoko Oda[1)], Shinji Wakao[1)]

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Solar Powered Vehicle of NIT challenging WSC2017 in Australia.

Hideki Jonokuchi[1,2)], Kousuke Ide[2)], Naoki Harada[2)], Hiroki Ataka[2)], Osamu Eryu[3)], Masayoshi Umeno[3)]

[1)] IMRA AMERICA INC. at Nagoya Instititute of Technology., [2)] Nagoya Institute of Technology, [3)] Emeritus of Nagoya Institute of Technology

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EVALUATION OF BIPV COMPETITIVENESS & MARKET POTENTIAL IN KEY EUROPEAN COUNTRIES

Gaëtan Masson[1)], Philippe Macé[1)], Adel El Gammal[1)]

[1)] Becquerel Institute

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DIFFERENCE OF GRID CODE FOR PV INVERTER IN THAILAND AND OTHERS

Ballang Muenpinij[1)], Sittichai Munggornrit[1)], Manit Seapan[1)], Anawach Sangswang[1)], Tanokkorn Chenvidhaya[1)], Dhirayut Chenvidhya[1)], Krissanapong Kirtikara[1)]

[1)] CES Solar Cells Testing Center, Pilot Plant Development and Training Institute, King Mongkut's University of Technology Thonburi

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A Detailed Hourly Snow Model with Photo, Temperature and Irradiance Parameter Validation in Northern Japan for More Accurate Energy Yield Predictions in Snowy Conditions

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AN ANALYSIS OF ENERGY TIME SHIFT PV APPLICATION FOR PREVENTING UNEXPECTED CURRENT ABSORPTION FROM GRID

CHAHO AHN[1)]

[1)] OCI

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DESIGN OPTIMIZATION AND EXPERIMENTAL PERFORMANCE OF PV AND PICO- HYDRO GENERATOR SYSTEM FOR HIGHLAND RURAL LEARNING CENTER IN THAILAND

Teerasak Somsak[1)], Assawathep Sanpin[2)], Worrajak Muangjai[1)], Nopporn Patcharaprakiti[2)], Jutturit Thongporn[2)]

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AN INVESTIGATION OF LOAD SHIFTING WITH PV HOME BATTERY IN THAILAND

Teerasak Somsak[1)], Rattadach Kundach[2)], Nuttaphon Tiwongsa[2)], Nopporn Patcharaprakiti[2)], Anon Namin[2)], Kosol Oranpiroj[2)], worrajak Muangjai[1)], jutturit thongpron[2)]

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OPTIMIZING WRF INPUT PARAMETERS USING EXPLORATORY DATA ANALYSIS

Malcolm Ng[1)], Hadrien Verbois[1)], Robert Huva[1)], Wilfred Walsh[1)]

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DEVELOPMENT OF SHORT-TERM PREDICTION METHOD FOR OPTIMUM POWER CONTROL BASED ON ACTUAL MEASUREMENT DATA ANALYSIS OF PHOTOVOLTAIC POWER GENERATION

Mitsuhiro Umizaki[1)], Fumichika Uno[1)], Takashi Oozeki[1)]

[1)] National Institute of Advanced Industrial Science and Technology

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FORECASTING CONFIDENCE INTERVALS OF IRRADIATION IN SINGLE POINT BY USING AREAL NUMERICAL WEATHER

PREDICTION DATA

Takumi Ogawa[1)], Yuzuru Ueda[1)], Yoshinori Yamada[2)], Hideaki Ohtake[3)], Takashi Oozeki[3)], Jun-ichi Imura[4)]

[1)] Department of Electrical Engineering, Tokyo University of Science, [2)] Meteorological Research Institute, Japan Meteorological Agency, [3)] National Institute of Advanced Industrial Science and Technology, [4)] Tokyo Institute of Technology

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DAY-AHEAD ALLOCATION OF PLANNED POWER FLOW TO THE RESIDENTIAL HOUSES WITH PV AND BATTERY FOR MAXIMUM USE OF DISTRIBUTED BATTERIES

Jindan Cui[1)], Takahiro Sasaki[1)], Yuzuru Ueda[1)], Masakazu Koike[2)], Takayuki Ishizaki[3)], Jun-ichi Imura[3)]

[1)] Tokyo University of Science, [2)] Tokyo University of Marine Science and Technology, [3)] Tokyo Institute of Technology

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AN OPTIMAL DESIGN OF GRID CONNECTED PHOTOVOLTAIC SYSTEM WITH BATTERY FOR RESIDENTIAL CUSTOMER

Nopporn Patcharaprakiti[1)], Rattadach Kundach[1)], Teerasak Somsak[1)], Jutturit Thongpron[1)]

[1)] Electrical Engineering, Rajamangala University of Technology Lanna

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TRANSITION PATTERN ANALYSIS OF PV OUTPUT BASED ON PREDICTION INTERVAL ESTIMATION

Naohiro Koura[1)], Shinji Wakao[1)]

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