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***Optical Modeling and
Measurements for Solar Energy
Systems II***

Benjamin K. Tsai
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Contents

- v *Conference Committee*
- vii *Introduction*
- ix *Commercialization of large scale CPV: What lies ahead? (Plenary Paper) [7043-104]*
D. Holland, Solar Systems Pty. Ltd. (Australia)
- xv *Nanostructures for high-efficiency photovoltaics (Plenary Paper) [7047-102]*
H. A. Atwater, California Institute of Technology (United States)
- xix *Reliability of PV systems (Plenary Paper) [7048-101]*
J. H. Wohlgemuth, BP Solar International Inc. (United States)

SESSION 1 CELLS AND SYSTEMS MODELING AND MEASUREMENT I

- 7046 03 **Prediction of solar global radiation on a surface tilted to the south** [7046-18]
A. I. Kudish, E. G. Evseev, Ben-Gurion Univ. of the Negev (Israel)
- 7046 04 **Spectral optimization of CPV for integrated energy output** [7046-01]
M. McDonald, C. Barnes, SolFocus, Inc. (United States)
- 7046 05 **High-throughput photovoltaic cell characterization system** [7046-02]
V. Kochergin, Z. Shi, K. Dobson, Luna Innovations Inc. (United States)
- 7046 07 **Optical modeling of nanostructured films for selective coatings** [7046-05]
P. P. Altermatt, Univ. of Hannover (Germany) and Institute for Solar Energy Research Hamelin (Germany); Y. Yang, Institute for Solar Energy Research Hamelin (Germany) and Sun Yat-Sen Univ. (China); J. Wang, R. Reineke-Koch, F. Giovannetti, Institute for Solar Energy Research Hamelin (Germany)
- 7046 08 **Microstructured anti-reflection surface design for the omni-directional solar cells** [7046-03]
L. Chen, H. Yang, M. Tao, W. Zhou, The Univ. of Texas at Arlington (United States)

SESSION 2 CELLS AND SYSTEMS MODELING AND MEASUREMENT II

- 7046 09 **Monte Carlo simulations of quantum dot solar concentrators: ray tracing based on fluorescence mapping** [7046-06]
A. Schüler, A. Kostro, B. Huriel, C. Galande, J.-L. Scartezzini, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 7046 0A **Synthesis and optical characterization of C-SiO₂ and C-NiO sol-gel composite films for use as selective solar absorbers** [7046-07]
G. Makiwa, Univ. of Zimbabwe (Zimbabwe); G. Katumba, Council for Scientific and Industrial Research (South Africa); L. Olumekor, Univ. of Zimbabwe (Zimbabwe)

- 7046 0B **Quantifying the efficacy of solar selective absorber materials: the case of carbon nanoparticles dispersed in SiO₂, ZnO, and NiO matrices** [7046-08]
G. Katumba, Council for Scientific and Industrial Research (South Africa); A. Forbes, Council for Scientific and Industrial Research (South Africa) and Univ. of KwaZulu-Natal (South Africa); L. Olumekor, G. Makiwa, Univ. of Zimbabwe (Zimbabwe)

SESSION 3 SOLAR RESOURCES MODELING AND MEASUREMENT I

- 7046 0C **Modeling energy production for concentrating PV flat panel** [7046-10]
B. Chang, SV Solar (United States)
- 7046 0D **Fixed or tracking solar collectors? Helping the decision process with the Solar Resource Enhancement Factor** [7046-11]
C. A. Gueymard, Solar Consulting Services (United States)
- 7046 0E **Modeling IR radiative loss from Eppley PSP pyranometers** [7046-14]
F. Vignola, Univ. of Oregon (United States); C. Long, Pacific Northwest National Lab. (United States); I. Reda, National Renewable Energy Lab. (United States)

SESSION 4 SOLAR RESOURCES MODELING AND MEASUREMENT II

- 7046 0F **Corrections for rotating shadowband pyranometers for solar resource assessment** [7046-15]
N. Geuder, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); B. Pulvermüller, Solar Millennium AG (Germany); O. Vorbrugg, Flagsol GmbH (Germany)

POSTER SESSION

- 7046 0I **Pulse analysis spectroradiometer system for measuring the spectral distribution of flash solar simulators** [7046-20]
A. M. Andreas, D. R. Myers, National Renewable Energy Lab. (United States)
- 7046 0J **Shape and alignment measurement of the heliostat by laser deflectometry** [7046-21]
W. Xu, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate School of the Chinese Academy of Sciences (China); Z. Lu, H. Liu, H. Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China); Z. Ni, Aviation Univ. of Air Force (China)
- 7046 0M **Indoor characterization of photovoltaic modules under various conditions** [7046-24]
M. Zetl, O. Stern, O. Mayer, M. Hartung, M. Lynass, E. Bernal, GE Global Research Europe (Germany)

Author Index

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- 2 Cells and Systems Modeling and Measurement II
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- 3 Solar Resources Modeling and Measurement I
Christian A. Gueymard, Solar Consulting Services (United States)
- 4 Solar Resources Modeling and Measurement II
Christian A. Gueymard, Solar Consulting Services (United States)

Introduction

The solar energy industry has been growing at a rate of 20% to 25% per year, and has generated \$17.2 billion (US) in revenues in 2007. Production of high quality, reliable, and robust solar energy systems components for the market relies on the same fundamentals: careful measurements and good engineering models. Finding better ways to establish the quantity and quality of solar radiation resources depends upon good measurement technique and solar radiation models. New approaches to capturing, storing, and converting solar radiation into thermal and electrical energy begin with ideas, transition to theoretical models, and result in physical prototypes and finally production devices. Optical performance and properties measurements and models are crucial for advancing solar energy conversion system technologies.

The first two sessions on cells and systems modeling were chaired by Dr. Frank Vignola of the University of Oregon, manager of the university's Solar Monitoring Network. Topics included efficient characterization of photovoltaic cells in the production environment, anti-reflection, low concentration photovoltaics, nanostructured, dispersed, and composite selective coatings, quantum dot concentrators, and automatic parabolic concentrator focus control.

The two sessions on solar resource modeling and measurements were chaired by Dr. Christian Gueymard of Solar Consulting Services, internationally recognized author and solar modeling expert. Topics included infrared, spectral, and geometrical corrections in solar radiometry, fusion of ground and satellite estimates of solar radiation, optimal energy collection geometries, solar resource models for tilted surfaces, solar activity and atmospheric aerosols influences on solar resources, and solar resources over complex terrain.

Poster presentations and papers reporting on the measurement of the spectral content of flash solar simulators, laser based heliostat deflectometry, diffuse radiation over complex terrain, optimizing solar collection, and indoor characterization of photovoltaic modules rounded out the conference.

We thank the participants, the conference organizing committee, and the institutions sponsoring them, for the contributions resulting in an exceptional conference. The authors and program committee members represent the commitment of themselves and their respective institutions to building an economically stable future for our descendants, one new measurement, one new component, or one new model at a time.

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Daryl R. Myers

