PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 7339

, "Front Matter: Volume 7339," Proc. SPIE 7339, Enabling Photonics Technologies for Defense, Security, and Aerospace Applications V, 733901 (22 May 2009); doi: 10.1117/12.834338

SPIE.

Event: SPIE Defense, Security, and Sensing, 2009, Orlando, Florida, United States

PROCEEDINGS OF SPIE

Enabling Photonics Technologies for Defense, Security, and Aerospace Applications V

**Michael J. Hayduk
Peter J. Delfyett, Jr.
Andrew R. Pirich
Eric J. Donkor**
Editors

**13–14 April 2009
Orlando, Florida, United States**

Sponsored and Published by
SPIE

Volume 7339

Proceedings of SPIE, 0277-786X, v. 7339

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Enabling Photonics Technologies for Defense, Security, and Aerospace Applications V*, edited by Michael J. Hayduk, Peter J. Delfyett, Jr., Andrew R. Pirich, Eric J. Donkor, Proceedings of SPIE Vol. 7339 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X

ISBN 9780819476050

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2009, Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/09/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIEDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

vii Conference Committee

SESSION 1 LASERS AND OPTICAL DETECTORS

- 7339 02 **Frequency stabilized optical comb source with high finesse intracavity etalon (Invited Paper)** [7339-01]
I. Ozdur, S. Ozharar, M. Akbulut, D. Mandridis, F. Quinlan, P. J. Delfyett, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 03 **CW injection locking for long-term stability of frequency combs** [7339-02]
C. Williams, F. Quinlan, P. J. Delfyett, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 04 **A feedforward system for dynamic equalization of a chirped laser source suitable For photonic analog-to-digital conversion** [7339-03]
D. Mandridis, I. T. Ozdur, P. J. Delfyett, Jr., College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 05 **Low phase noise high power handling InGaAs photodiodes for precise timing applications (Invited Paper)** [7339-04]
S. Datta, A. Joshi, D. Becker, Discovery Semiconductors, Inc. (United States)
- 7339 06 **Epitaxially-grown germanium/silicon avalanche photodiodes for near infrared light detection (Invited Paper)** [7339-05]
Y. Kang, Intel Corp. (United States); H.-D. Liu, Intel Corp. (United States) and Univ. of Virginia (United States); M. Morse, M. J. Paniccia, Intel Corp. (United States); M. Zadka, S. Litski, G. Sarid, Numonyx (Israel); A. Pauchard, Consultant (Switzerland); Y.-H. Kuo, H.-W. Chen, W. Sfar Zaoui, J. E. Bowers, Univ. of California, Santa Barbara (United States); A. Beling, D. C. McIntosh, X. Zheng, J. C. Campbell, Univ. of Virginia (United States)

SESSION 2 KEYNOTE SESSION

- 7339 07 **OE-VCSEL based WDM modules: focus on manufacturing (Keynote Paper)** [7339-06]
P. Guilfoyle, M. Harris, D. Kumar, D. Peters, D. Louderback, OptiComp Corp. (United States)
- 7339 08 **Three-dimensional sensing, imaging, and recognition of objects having a small number of photons (Keynote Paper)** [7339-07]
I. Moon, Chosun Univ. (Korea, Republic of); B. Javidi, Univ. of Connecticut (United States)

SESSION 3 EMERGING COMPONENT TECHNOLOGY

- 7339 0A **2 x 2 quantum dot based switching device employing multimode interference effects (Invited Paper)** [7339-09]
N. Bickel, P. LiKamWa, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 0B **Tunable LYOT-filters** [7339-10]
E. Donkor, P. D. Kumavor, C. Villa, Univ. of Connecticut (United States)
- 7339 0C **Variable fiber-optic attenuator using optofluidics** [7339-11]
S. A. Reza, N. A. Riza, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 0D **Optofluidic tuning of multimode interference fiber filters** [7339-12]
J. E. Antonio-Lopez, D. A. May-Arrioja, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); P. LiKamWa, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 0E **Efficient T/R switch design for beam steering with liquid crystal spatial light modulator** [7339-28]
K. L. Drain, Q. Zhan, Univ. of Dayton (United States)

SESSION 4 PHOTONIC APPLICATIONS AND SYSTEMS

- 7339 0F **Extending dynamic range using ND filtering patterns on an 8-bit sensor** [7339-13]
C. Balogh, U.S. Army Night Vision & Electronic Sensors Directorate (United States)
- 7339 0G **A 1.28GSPS 12-bit optoelectronic analog-to-digital converter** [7339-14]
C. Villa, P. Kumavor, E. Donkor, Univ. of Connecticut (United States); G. Jin, Agiltron, Inc. (United States)
- 7339 0H **RF photonic notch filters in high dynamic range links** [7339-15]
C. Middleton, R. DeSalvo, Harris Corp. (United States)
- 7339 0I **Sub-millimeter resolution laser ranging at 9.3 kilometers using temporally stretched frequency chirped pulses from a mode-locked laser (Invited Paper)** [7339-16]
M. U. Piracha, D. Nguyen, D. Mandridis, College of Optics & Photonics, Univ. of Central Florida (United States); T. Yilmaz, D. Gaudiosi, Raydiance, Inc. (United States); P. J. Delfyett, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 0J **Beam steering performance of electrowetting microprism arrays** [7339-17]
W. Han, J. W. Haus, P. McManamon, Univ. of Dayton (United States); J. Heikenfeld, N. R. Smith, J. Yang, Univ of Cincinnati (United States)
- 7339 0K **A MIMO-inspired rapidly switchable photonic interconnect architecture** [7339-18]
H. Zmuda, Univ. of Florida (United States); J. Osman, M. Fanto, T. McEwen, Air Force Research Lab. (United States)

SESSION 5 OPTICAL COMMUNICATIONS AND SIMULATIONS

- 7339 0M **New preemptive scheduling for OBS networks considering cascaded wavelength conversion** [7339-20]
X. Gao, M. A. Bassiouni, G. Li, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 0O **CAD model for co-propagating spatially multiplexed channels of same wavelength over standard multimode fibers** [7339-22]
S. H. Murshid, R. Biswas, A. Chakravarty, Florida Institute of Technology (United States)
- 7339 0P **Optical signal infrastructure in a SPICE-based optoelectronic simulation framework** [7339-23]
P. Gunupudi, T. Smy, Carleton Univ. (Canada); J. Klein, J. Jakubczyk, Optiwave Systems Inc. (Canada)

POSTER SESSION

- 7339 0Q **All-fiber tunable MMI fiber laser** [7339-24]
J. E. Antonio-Lopez, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); A. Castillo-Guzman, Univ. Autonoma de Nuevo Leon (Mexico); D. A. May-Arriola, Instituto Nacional de Astrofísica, Óptica y Electrónica (Mexico); R. Selvas-Aguilar, Univ. Autonoma de Nuevo Leon (Mexico); P. LiKamWa, College of Optics & Photonics, Univ. of Central Florida (United States)
- 7339 0R **Cr-doped materials as potential broadband and tunable sources** [7339-29]
J.-S. Wang, V. Huang, National Sun Yat-sen Univ. (Taiwan); Y.-S. Lin, I-Shou Univ. (Taiwan); W.-H. Cheng, National Sun Yat-sen Univ. (Taiwan)
- 7339 0S **Nitride image intensifiers** [7339-30]
J. W. Glesener, L-3 Electro-Optical Systems (United States); A. M. Dabiran, SVT Associates, Inc. (United States); J. P. Estrera, L-3 Electro-Optical Systems (United States)

Author Index

Conference Committee

Symposium Chair

Ray O. Johnson, Lockheed Martin Corporation (United States)

Symposium Cochair

Michael T. Eismann, Air Force Research Laboratory (United States)

Conference Chairs

Michael J. Hayduk, Air Force Research Laboratory (United States)

Peter J. Delfyett, Jr., College of Optics & Photonics, University of Central
Florida (United States)

Andrew R. Pirich, ACP Consulting (United States)

Eric J. Donkor, University of Connecticut (United States)

Program Committee

H. John Caulfield, Diversified Research Corporation (United States)

Reinhard K. Erdmann, Air Force Research Laboratory (United States)

Michael L. Fanto, Air Force Research Laboratory (United States)

Bahram Javidi, University of Connecticut (United States)

Robert L. Kaminski, Air Force Research Laboratory (United States)

Guifang Li, College of Optics & Photonics, University of Central Florida
(United States)

Joseph M. Osman, Air Force Research Laboratory (United States)

Edward W. Taylor, International Photonics Consultants, Inc. (United
States)

Henry Zmuda, University of Florida (United States)

Session Chairs

- 1 Lasers and Optical Detectors
Eric J. Donkor, University of Connecticut (United States)
Michael L. Fanto, Air Force Research Laboratory (United States)
- 2 Keynote Session
Michael J. Hayduk, Air Force Research Laboratory (United States)
Robert L. Kaminski, Air Force Research Laboratory (United States)

- 3 Emerging Component Technology
Peter J. Delfyett, Jr., College of Optics & Photonics, University of Central Florida (United States)
Andrew R. Pirich, ACP Consulting (United States)
- 4 Photonic Applications and Systems
Andrew R. Pirich, ACP Consulting (United States)
Guifang Li, College of Optics & Photonics, University of Central Florida (United States)
- 5 Optical Communications and Simulations
Michael L. Fanto, Air Force Research Laboratory (United States)
Michael J. Hayduk, Air Force Research Laboratory (United States)