Photonics and Optoelectronics Meetings (POEM) 2011

Optoelectronic Devices and Integration

Erich Kasper
Jinzhong Yu
Xun Li
Xinliang Zhang
Jinsong Xia
Junhao Chu
Zhijiang Dong
Bin Hu
Yan Shen
Editors

2–5 November 2011
Wuhan, China

Organized by
Wuhan National Laboratory for Optoelectronics (China)

Sponsored by
Huazhong University of Science and Technology (China) • China Hubei Provincial Science and Technology Department • Wuhan East Lake National Innovation Model Zone (Optics Valley of China, OVC) • The Optical Society • Hubei Provincial Foreign Experts Affairs Bureau

Supported by
Ministry of Education (China) • State Administration of Foreign Experts Affairs (China) • National Natural Science Foundation Committee of China

Cooperating Organizations
IOP—Institute of Physics • The Laser Institute of America (United States) • IET—The Institution of Engineering and Technology • International Biomedical Optics Society • IEEE Photonics Society (Singapore and Hong Kong Chapters) • Chinese Optical Society

Published by
SPIE
PART A Optoelectronic Devices and Integration (OEDI)

OPTOELECTRONIC DEVICES AND SUBSYSTEM FOR OPTICAL NETWORKS

8333 02 Novel optical en/decoder based on micro-ring-reflector (Invited Paper) [8333-62]
X. Wang, Z. Gao, Heriot-Watt Univ. (United Kingdom)

SLOW AND FAST LIGHT DEVICES

8333 03 Continuously tunable time delay and advance in coupling-modulated microring resonators [8333-58]
Y. Hu, X. Xiao, X. Li, K. Xiong, Z. Li, Y. Li, T. Chu, Y. Yu, J. Yu, Institute of Semiconductors (China)

SILICON PHOTONICS AND OPTICAL INTERCONNECTION

8333 04 Integrated switchable ring filters on silicon for optical interconnects (Invited Paper) [8333-48]
J. Yang, T. Hu, C. Qiu, X. Jiang, W. Wang, P. Liu, Zhejiang Univ. (China); M. Yang, Univ. of Nevada (United States) and Zhejiang Univ. (China)

8333 05 CMOS compatible silicon-based Mach-Zehnder optical modulators with improved extinction ratio [8333-31]
Z. Li, L. Zhou, Y. Hu, X. Xiao, Y. Yu, J. Yu, Institute of Semiconductors (China)

MICROWAVE PHOTONICS AND FREE SPACE OPTICAL COMMUNICATION

8333 06 Photonic generation of ultra-wideband pulses using a fiber delay interferometer [8333-23]
F. Wang, Chongqing Univ. of Technology (China); X. Zhang, Y. Zhang, Huazhong Univ. of Science and Technology (China); E. Xu, Nanjing Univ. of Posts and Telecommunications (China)

8333 07 7.5Gbps 40 km horizontal path DWDM optical link experiment [8333-35]
Y. Ai, Z. Xiong, J. Chen, Wuhan Univ. (China); F. Zhang, Y. Liu, The Institute of Beijing Tracking and Communication Technology (China); S. Zhang, Beijing Guokehuanyu Space Technology Inc. (China); X. Shan, D. Ran, Y. Xiao, Wuhan Univ. (China)
8333 08 Dispersion management in a passively mode-locked VECSEL at 1.55 μm [8333-40]
Z. Zhao, S. Bouchoule, Lab. de Photonique et de Nanostructures, CNRS (France);
J. Decobert, Alcatel Ill-V Lab (France); E. Galopin, J.-C. Harmand, J.-L. Oudar, Lab. de
Photonique et de Nanostructures, CNRS (France)

8333 09 All-optical signal processing using planar Bragg gratings [8333-43]
C. Sima, J. C. Gates, H. L. Rogers, B. D. Snow, C. Holmes, M. N. Zervas, P. G. R. Smith, Univ. of
Southampton (United Kingdom)

8333 0A Single-mode silicon-on-insulator elliptical microdisk resonators with high Q factors [8333-60]
K. Xiong, X. Xiao, Y. Hu, Z. Li, T. Chu, Y. Yu, J. Yu, Institute of Semiconductors (China)

8333 0B Analysis of modulation characteristics of widely tunable sampled-grating distributed
reflector (SGDBR) lasers based on transmission line laser model [8333-46]
W. Chen, S. Hu, Y. Yu, Wuhan National Lab, for Optoelectronics (China)

8333 0C Miniature intensity modulator based on a silicon-polymer hybrid plasmonic waveguide
[8333-12]
X. Sun, L. Zhou, X. Li, Z. Hong, S. Liu, J. Chen, Shanghai Jiao Tong Univ. (China)

8333 0D Systematic investigation of coupling-modulated microring resonators based on interleaved
p-n junctions [8333-59]
X. Li, Y. Hu, X. Xiao, K. Xiong, Z. Li, Y. Li, T. Chu, Y. Yu, J. Yu, Institute of Semiconductors (China)

8333 0E The analysis of optical transmission in three-dimensional waveguide coupler [8333-44]
T. Lin, Q. Miao, Wuhan Univ. (China); J. He, Huazhong Univ. of Science and Technology
(China); C. Li, P. He, Wuhan Univ. (China)

8333 0F Tunable pulse compression via doublet Brillouin gain lines in an optical fiber [8333-49]
Q. Tian, G. Qin, L. Liu, T. Jiang, W. Qin, Jilin Univ. (China)

SILEICON PHOTONICS AND OTHER RELATED TECHNOLOGIES

8333 0G Bioinspired solar water splitting, sensitized solar cells, and ultraviolet sensor based on
semiconductor nanocrystal antenna/graphene nanoassemblies [8333-10]
H. Chang, Tohoku Univ. (Japan); X. Lv, Technical Institute of Physics and Chemistry (China);
Z. Zheng, The Hong Kong Polytechnic Univ. (Hong Kong, China); H. Wu, Tohoku Univ. (Japan)

8333 0H Nanomedicine crystals-inspired optoelectronic device materials and processing [8333-53]
Y. Fang, F. Wang, R. Wu, Fudan Univ. (China)

8333 0I 25Gb/s fully CMOS-compatible silicon modulator based on interleaved PN junctions
[8333-56]
X. Xiao, Y. Hu, H. Xu, X. Li, K. Xiong, Z. Li, T. Chu, Y. Yu, J. Yu, Institute of Semiconductors
(China)
<table>
<thead>
<tr>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>8333 OJ</td>
<td>The effects of oxide apertures on the characteristics of resonant-cavity light-emitting diodes</td>
<td>W. Yang, J. Li, P. Sun, L. Ma, Beijing Univ. of Technology (China)</td>
</tr>
<tr>
<td>8333 OK</td>
<td>Theoretical and simulation analysis of the fiber optical parametric amplifier (FOPA) with cascaded structure</td>
<td>J. Gao, Y. Cao, F. Chen, B. Sun, Z. Hu, Univ. of Electronic Science and Technology of China (China)</td>
</tr>
<tr>
<td>8333 OL</td>
<td>Polarization-controlled single-mode photonic-crystal VCSEL</td>
<td>T. Cao, C. Xu, S. Wei, Y. Xie, M. Mao, Beijing Univ. of Technology (China)</td>
</tr>
<tr>
<td>8333 OM</td>
<td>The fabrication and performance analysis of proton implantation VCSEL</td>
<td>M. Mao, C. Xu, S. Wei, Y. Xie, T. Cao, Beijing Univ. of Technology (China)</td>
</tr>
<tr>
<td>8333 ON</td>
<td>Full 3D FDTD analysis of transverse mode characteristics in surface relief VCSELs</td>
<td>S. Wei, C. Xu, M. Mao, Y. Xie, T. Cao, Beijing Univ. of Technology (China)</td>
</tr>
<tr>
<td>8333 OO</td>
<td>Simulation study on spectrum beam combining based on reflection volume Bragg grating</td>
<td>Y. Yi, M. Li, C. Hu, F. Chen, Wuhan Univ. of Technology (China)</td>
</tr>
<tr>
<td>8333 OP</td>
<td>Synthesis and fluorescence switching of a photochromic diarylethene bearing pyridine unit</td>
<td>M. Liu, G. Liu, S. Cui, Jiangxi Science and Technology Normal Univ. (China)</td>
</tr>
<tr>
<td>8333 OQ</td>
<td>Synthesis and properties of a novel diarylethene compound based on five and six rings</td>
<td>Z. Tong, S. Pu, S. Cui, Jiangxi Science &amp; Technology Normal Univ. (China)</td>
</tr>
<tr>
<td>8333 OR</td>
<td>Synthesis of a symmetrical diarylethene with two different substituents for optical recording</td>
<td>S. Cui, S. Pu, W. Liu, Jiangxi Science and Technology Normal Univ. (China)</td>
</tr>
<tr>
<td>8333 OS</td>
<td>A distributed big data storage and data mining framework for solar-generated electricity quantity forecasting</td>
<td>J. Wang, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics, (China); Y. Chen, R. Hua, Huazhong Univ. of Science and Technology (China); P. Wang, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics, (China); J. Fu, Meteorological Service Ctr. of Hubei Province (China)</td>
</tr>
<tr>
<td>8333 OT</td>
<td>Dispersion engineering of slot photonic crystal waveguides</td>
<td>C. Caer, E. Cassan, Institut d'Electronique Fondamentale, Univ. Paris-Sud XI (France)</td>
</tr>
<tr>
<td>8333 OU</td>
<td>Study on unidirectional acquisition in free-space optical communication based on GPS</td>
<td>Y. Xiao, Wuhan Univ. (China) and Xiaogan Univ. (China); Y. Ai, R. Dong, Wuhan Univ. (China)</td>
</tr>
</tbody>
</table>
**Experiment of space laser communication based on adaptive optics system** [8333-32]
Z. Xiong, Y. Ai, J. Chen, Wuhan Univ. (China); E. Chen, Beijing Institute of Tracking and Communication Technology (China); Y. Wu, The Institute of Optoelectronics (China)

**Catadioptric dual-zone Fresnel condenser with super relative aperture** [8333-16]
J. Wang, E. Qu, H. Yang, J. Cao, Z. Fan, Xi'an Institute of Optics and Precision Mechanics (China)

**A butt-coupled low dispersion slow light photonic crystal waveguide** [8333-06]
X. Zhang, H. Peng, X. Fan, D. Chen, Z. Wu, Univ.of Electronic Science and Technology of China (China)

**All-optical in-band OSNR monitors based on unphase-matched four-wave mixing** [8333-30]
S. Sun, J. Li, S. Cui, C. Xiang, L. Li, Q. You, D. Liu, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China)

**Optically switchable and tunable ultrawideband doublet generation using semiconductor optical amplifier and optical delay line** [8333-41]
Z. Hu, B. Sun, F. Chen, K. Chen, Y. Cao, Univ. of Electronic Science and Technology of China (China)

**Investigation on nonlinear characteristics of the Mach-Zehnder intensity modulator based on Bessel series expansion** [8333-02]
X. Fan, J. Yan, X. Zhang, L. Xu, L. Chen, S. Zhang, Y. Liu, Univ. of Electronic Science and Technology of China (China)

**Diffraction properties study of multi-layer reflection volume holographic grating under ultra-short pulse readout** [8333-19]
Y. Yi, M. Li, F. Chen, L. Wang, Wuhan Univ. of Technology (China)

**200 GHz-spacing WDM transmission system employing ultrawideband optical signals** [8333-39]
J. Shao, J. Sun, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China)

**Optimizing the phase-matching parameters of a BIBO crystal for ultrafast spontaneous parametric down conversion** [8333-34]
G.-W. Huo, T.-Y. Zhang, R.-G. Wan, Xi'an Institute of Optics and Precision Mechanics (China); M.-Z. Zhang, Xi'an Univ. Post and Telecommunication (China); G.-H. Cheng, W. Zhao, Xi'an Institute of Optics and Precision Mechanics (China)

**Experiments on a compact and robust polarization-entangled photon source** [8333-29]
S.-W. Zhang, Xi'an Institute of Optics and Precision Mechanics (China) and Xi'an Jiaotong Univ. (China) and Graduate School of Chinese Academy of Sciences (China); T.-Y. Zhang, Xi'an Institute of Optics and Precision Mechanics (China); Y.-P. Yao, Xi'an Institute of Optics and Precision Mechanics (China) and Graduate School of Chinese Academy of Sciences (China); R.-G. Wan, Xi'an Institute of Optics and Precision Mechanics (China); S.-W. Zou, Xi'an Institute of Optics and Precision Mechanics (China) and Graduate School of Chinese Academy of Sciences (China)
8333 15  A study of thermal properties of power AlGaNp and InGaN LEDs [8333-09]
Y. Ding, W. Guo, B. Cui, D. Cui, G. Wu, W. Yan, Beijing Univ. of Technology (China)

8333 16  Influence of the waveguide coupling fluctuation on the light coupling dynamics [8333-50]
L. Ju, W. Wang, Hubei Univ. (China); Y. Wang, Liteon Singapore Pte Ltd. (Singapore)

8333 17  All optical Schmitt trigger based on nonlinear quasi periodic photonic crystals [8333-15]
M. H. Teimourpour, Kermanshah Univ. of Technology (Iran, Islamic Republic of)

PART B  Solar Cells, Solid State Lighting, and Information Display Technologies (SSID)

WORKSHOP ON FRONTIER SCIENCE OF RENEWABLE ENERGY IN ORGANIC OPTOELECTRONICS

8333 18  Organic magnetic-field effect examined in frequency domain and time domain (Keynote Paper) [8333-113]
F. Wang, R. Lin, K. A. Hutchinson, J. Rybicki, M. Wohlgemuth, Univ. of Iowa (United States)

8333 19  Effect of temperature and magnetic field on the photocurrent response of biomolecular bulk-hetero junction (Invited Paper) [8333-114]
H. Tajima, Y. Sekiguchi, The Univ. of Tokyo (Japan); M. Matsuda, Kumamoto Univ. (Japan)

8333 1A  Spin-orbit coupling, spin relaxation, and spin diffusion in organic solids (Invited Paper) [8333-116]
Z.-G. Yu, SRI International (United States)

8333 1B  Exciton formation in dye doped OLEDs using electrically detected magnetic resonance (Keynote Paper) [8333-111]
A. Batagin-Neto, UNESP (Brazil); J. A. Gómez, FFCLRP-USP (Brazil); F. A. Castro, National Physical Lab. (United Kingdom); F. Nuesch, EMPA (Switzerland); L. Zuppiroli, Lab. d'optoélectronique dês matériaux moléculaire, (Switzerland); C. F. O. Graeff, UNESP (Brazil)

PROPERTIES OF OPTOELECTRONIC SEMICONDUCTOR MATERIALS

8333 1C  Light concentration in polymer bulk heterojunction solar cells with plasmonic nanoparticles [8333-101]
J. Zhu, B. Zeng, Univ. of Electronic Science and Technology of China (China); R. S. Kim, Air Force Research Lab. (United States); Z. Wu, Univ. of Electronic Science and Technology of China (China)

POSTER SESSION

8333 1D  Optical properties of TiO2 thin film grown on quartz substrate by sol-gel method [8333-105]
J. Tian, East China Normal Univ. (China); H. Deng, Shanghai Univ. (China); L. Sun, H. Kong, P. Yang, J. Chu, East China Normal Univ. (China)
8333 1E Optical property of the co-doped La and Mg BiFeO₃ films fabricated by sol-gel method [8333-104]
L. Peng, East China Normal Univ. (China); H. Deng, Shanghai Univ. (China); J. Tian, H. Deng, P. Yang, J. Chu, East China Normal Univ. (China)

8333 1F Structural and optical properties of LuFeO₃ thin films prepared on silicon (100) substrate by pulsed laser deposition [8333-102]
L. Zhu, East China Normal Univ. (China); H. Deng, Shanghai Univ. (China); J. Tian, P. Yang, J. Chu, East China Normal Univ. (China)

8333 1G Si nanowires arrays fabricated by wet chemical etching for antireflection and self-cleaning [8333-112]
W. Zhang, Wuhan National Lab. for Optoelectronics (China) and Wuhan Univ. of Science & Technology (China); X. Wang, W. Lai, Z. Tang, Wuhan National Lab. for Optoelectronics (China)

8333 1H The effects of growth temperature of the pulse atomic layer epitaxy AlN films grown on sapphire by MOCVD [8333-117]
S. L. Li, H. Wang, J. Zhang, Y.-Y. Fang, W. Fan, W. Tian, Y. Li, Y. Tian, H. Xiong, C. Q. Chen, Wuhan National Lab. for Optoelectronics (China)

8333 1I The influence of AlN buffer layer thickness grown by pulsed atomic layer epitaxy on the properties of GaN epilayer [8333-118]
J. Zhang, H. Xiong, S. L. Li, H. Wang, Y. Y. Fang, J. Y. Tang, Y. Li, W. Tian, C. Q. Chen, Wuhan National Lab. for Optoelectronics (China)

Author Index