PROCEEDINGS OF SPIE

[SPIDigitalLibrary.org/conference-proceedings-of-spie](https://spiedigitallibrary.org/conference-proceedings-of-spie)

Front Matter: Volume 7514

, "Front Matter: Volume 7514," Proc. SPIE 7514, Photonics and Optoelectronics Meetings (POEM) 2009: Fiber Optic Communication and Sensors, 751401 (4 November 2009); doi: 10.1117/12.852233

SPIE.

Event: Photonics and Optoelectronics Meetings 2009, 2009, Wuhan, China

PROCEEDINGS OF SPIE

*Photonics and Optoelectronics
Meetings (POEM) 2009*

Fiber Optic Communication and Sensors

Dieter Stefan Jäger
Hequan Wu
Shuisheng Jian
Desheng Jiang
Deming Liu
Editors

8–10 August 2009
Wuhan, China

Organized by
Wuhan National Laboratory for Optoelectronics (China)

Sponsored by
Chinese Optical Society • Huazhong University of Science and Technology (China) • China Hubei
Provincial Science Technology Department • Administration Committee of Wuhan East Lake High-Tech
Development Zone (China) • The State Optoelectronic Information Industry Base of China

Supported by
Ministry of Education of China • Optical Society of America • Laser Institute of America • Frontiers of
Optoelectronics in China • Editorial Office of Optics & Optoelectronics Technology • Opticsjournal.net
OFweek.com • The China Science-Meeting Online • Laser Manufacture News

Published by
SPIE

Volume 7514

Proceedings of SPIE, 0277-786X, v. 7514

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 *Photonics and Optoelectronics Meetings (POEM) 2009: Fiber Optic Communication and Sensors*, edited by Dieter Stefan Jäger, Hequan Wu, Shuisheng Jian, Desheng Jiang, Deming Liu, Proceedings of SPIE Vol. 7514 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X
ISBN 9780819479037

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.

SPIDigitalLibrary.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

ix	<i>Symposium Committees</i>
xiii	<i>Conference Committee</i>

FIBER OPTIC COMMUNICATION AND SENSORS

7514 02	A FBG-based, temperature-insensitive vibration sensor [7514-40] W. Zhou, X. Dong, L. Li, K. Ni, Y. Jin, China Jiliang Univ. (China)
7514 03	A high sensitivity and large dynamic input range O-E-O optical wavelength converter for hybrid PONs [7514-50] L. Deng, D. Liu, M. Zhang, Y. Qian, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China)
7514 04	A method of events discriminant in fiber-optic network perimeter protection alarm system [7514-77] F. Cao, D. Liu, Q. Sun, K. Yang, Huazhong Univ. of Science and Technology (China)
7514 05	A novel single-polarization single-mode photonic crystal fiber coupler [7514-20] H. Li, S. Lou, S. Feng, T. Guo, L. Yao, L. Wang, W. Chen, S. Jian, Beijing Jiaotong Univ. (China)
7514 06	A ratio method of FCG demodulation on strain measurement [7514-71] W. Li, M. Gao, J. Pan, S. He, Wuhan Univ. of Technology (China)
7514 07	An adaptive low complexity and high performance BLAST detection algorithm [7514-76] D. Wang, J. Fu, G. Zhu, D. Liu, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China)
7514 08	An efficient method for extension of the dynamic input range of burst-mode all-optical wavelength conversion module [7514-42] Y. Qian, D. Liu, M. Zhang, L. Deng, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China)
7514 09	Analysis and testing of key technologies of PTN on MAN [7514-36] X. Feng, Wuhan Institute of Technology (China); Y. Chen, The Second Artillery Command College (China); W. Cui, Wuhan Institute of Technology (China)
7514 0A	Analysis of mode coupling in the dispersion compensating photonic crystal fiber [7514-06] W. Chen, S. Lou, L. Wang, H. Li, T. Guo, S. Jian, Beijing Jiaotong Univ. (China)
7514 0B	Analysis of multiwavelength clock recovery based on Stimulated Brillouin Scattering [7514-37] M. Chen, S. Feng, S. Jian, Ministry of Education (China) and Beijing Jiaotong Univ. (China)

- 7514 0C **Compact Mach-Zehnder interferometer based on photonic crystal fiber and its application in switchable multi-wavelength fiber laser** [7514-07]
W. Chen, S. Lou, L. Wang, H. Li, T. Guo, S. Jian, Beijing Jiaotong Univ. (China)
- 7514 0D **Design and analysis of imagery system of laser scanning** [7514-17]
T. Li, Z. Wang, X. Zhang, L. Hou, C. Jiang, Shandong Univ. of Technology (China)
- 7514 0E **Design and implementation of the broadband network access system over MoCA** [7514-27]
J. Huang, D. Liu, G. Wu, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China)
- 7514 0F **Optimal design of wavelength converters based on four-wave mixing in photonic crystal fibers with two zero-dispersion wavelengths** [7514-05]
S. Cui, D. Liu, Y. Wang, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China)
- 7514 0G **Devices of radio over fiber system based on fiber Bragg grating (Invited Paper)** [7514-64]
L. Pei, C. Qi, T. Ning, S. Gao, J. Li, Beijing Jiaotong Univ. (China)
- 7514 0H **Erbium-doped photonic crystal fiber laser** [7514-53]
H. Yang, S. Ruan, Y. Yu, H. Zhou, Shenzhen Univ. (China)
- 7514 0I **Experimental study of discharge for 200W RF excited slab lasers** [7514-54]
Y. Xiao, X. Tang, J. Liu, Y. Qin, G. Li, F. Yan, W. Du, L. Xiao, Huazhong Univ. of Science and Technology (China)
- 7514 0J **Fabrication of nano-Bragg polymer waveguide by soft-lithography process** [7514-35]
J.-K. Kuo, W.-C. Chang, Southern Taiwan Univ. of Technology (Taiwan); K.-F. Yarn, Far East Univ. (Taiwan); W.-C. Chuang, National Formosa Univ. (Taiwan)
- 7514 0K **FBG hydrogen sensors based on surface plasmon resonance interaction** [7514-67]
Y. Sun, M. Yang, B. Wang, H. Wei, Wuhan Univ. of Technology (China)
- 7514 0L **Four-element fiber laser hydrophone array** [7514-63]
F. Zhang, W. Zhang, F. Li, Y. Liu, Institute of Semiconductors (China)
- 7514 0M **Framework of a real-time video monitoring system** [7514-52]
K. Yang, D. Liu, M. Zhang, F. Cao, Y. Qian, Huazhong Univ. of Science and Technology (China)
- 7514 0N **Influence of underwater 3D imaging precision by water light scattering** [7514-78]
W. Zhang, K. Yang, M. Xia, W. Li, J. Tan, Huazhong Univ. of Science and Technology (China)
- 7514 0O **Integrated optical waveguide electric field sensor for lightning electric field measurements** [7514-29]
B. Sun, F. Chen, Univ. of Electronic Science and Technology of China (China)
- 7514 0P **Nondestructive measurement soluble solids content of apple by portable and online near infrared spectroscopy** [7514-44]
X. Sun, H. Zhang, Y. Pan, Y. Liu, East China Jiatong Univ. (China)

- 7514 0Q **Numerical simulation and experimental study of self-mixing speckle generated in an erbium-doped fiber ring laser** [7514-03]
D. Han, X. Zuo, L. Ma, Nanchang Univ. (China)
- 7514 0R **Optical generation of microwave signal using FBG-based double-ring fiber laser assisted by saturable absorber** [7514-65]
Q. Sun, Huazhong Univ. of Science and Technology (China); J. Wang, Huazhong Univ. of Science and Technology (China) and Univ. of Southern California (United States); D. Liu, Huazhong Univ. of Science and Technology (China); P. Shum, Nanyang Technological Univ. (China)
- 7514 0S **Optical property of BaTiO₃ ferroelectric film at room temperature** [7514-46]
Y. Fu, X. Zhang, Z. Xu, Huazhong Univ. of Science and Technology (China)
- 7514 0T **Preparation and photoluminescence properties of porous silicon** [7514-51]
Z. Chen, Z. Xu, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China)
- 7514 0U **Propagation characteristics of pico-second chirped soliton in dispersion-flatted fibers with convex dispersion profile** [7514-74]
X. Li, Liaocheng Univ. (China) and Qufu Normal Univ. (China); H. Zheng, S. Liu, Liaocheng Univ. (China); Y. Xia, Qufu Normal Univ. (China)
- 7514 0V **Proposal of a Star-16QAM system based on Intersymbol Interference (ISI) suppression and coherent detection** [7514-56]
L. Zhang, X. Hu, T. Wang, Q. Liu, Y. Su, Shanghai Jiao Tong Univ. (China)
- 7514 0W **Research and implementation of the burst-mode optical signal bit-error test** [7514-11]
Q. Huang, C. Ma, W. Shi, W. Chen, Wuhan Univ. of Technology (China)
- 7514 0X **Research of application mode for FTTX technology** [7514-33]
Z. Wang, Wuhan Institute of Technology (China); X. Yun, FiberHome Telecommunication Technologies Co., Ltd. (China); W. Huang, Wuhan Institute of Technology (China)
- 7514 0Y **Research on non-linearity correction of 2D-PSD** [7514-28]
X. Zheng, S. Chen, W. Chen, X. Wu, S. Xiang, Wuhan National Lab. for Optoelectronics (China)
- 7514 0Z **Research on the key technology and application of the packet transmission network** [7514-31]
X. Yun, FiberHome Telecommunication Technologies Co., Ltd. (China); Z. Wang, Wuhan Institute of Technology (China)
- 7514 10 **Research on theory and technology for improving optical receiver efficiency in turbulent atmosphere** [7514-43]
R. Bie, X. Yuan, M. Zhao, Huazhong Univ. of Science and Technology (China)
- 7514 11 **Reverse design of the SMF-PCF F-P cavity** [7514-41]
L. Wang, S. Lou, W. Chen, H. Li, T. Guo, Beijing Jiaotong Univ. (China)

- 7514 12 **Semiconductor quantum wells: old technology or new device functionalities (Invited Paper)** [7514-14]
R. M. Kolbas, Y. C. Lo, K. Y. Hsieh, J. H. Lee, F. E. Reed, D. Zhang, T. Zhang, North Carolina State Univ. (United States)
- 7514 13 **Strain and temperature discrimination by using a birefringence fiber loop and a long period grating in a photonic crystal fiber** [7514-25]
C.-L. Zhao, China Jiliang Univ. (China); J. Zhao, South China Normal Univ. (China); W. Jin, Hong Kong Polytechnic Univ. (Hong Kong, China); X. Huang, South China Normal Univ. (China); X. Dong, China Jiliang Univ. (China)
- 7514 14 **Switchable single-longitudinal-mode dual-wavelength erbium-doped fiber laser based on one polarization-maintaining fiber Bragg grating incorporating saturable absorber** [7514-12]
S. Feng, O. Xu, S. Lu, M. Chen, S. Jian, Beijing Jiaotong Univ. (China)
- 7514 15 **Technique analysis of T-MPLS OAM and MPLS-TP OAM** [7514-32]
X. Yun, FiberHome Telecommunication Technologies Co., Ltd. (China); Z. Wang, Wuhan Institute of Technology (China)
- 7514 16 **Temperature-independent fiber Bragg grating acceleration sensor** [7514-13]
L. Li, X. Dong, W. Zhou, Y. Jin, Y. Sun, China Jiliang Univ. (China)
- 7514 17 **Testing and reference model analysis of FTTH system** [7514-26]
X. Feng, W. Cui, Wuhan Institute of Technology (China); Y. Chen, The Second Artillery Command College (China)
- 7514 18 **The comparison of two methods to manufacture fused biconical tapered optical fiber coupler** [7514-82]
Y. Wang, H. Liu, Huazhong Univ. of Science and Technology (China)
- 7514 19 **The influence of adhesive on fiber Bragg grating strain sensor** [7514-18]
J. Chen, H. Gong, S. Jin, S. Li, China Jiliang Univ. (China)
- 7514 1A **The integrated impact of the combination of PMD and several nonlinear effects on 160G bit/s DWDM systems** [7514-66]
W. Yu, O. Zibo, Huazhong Univ. of Science and Technology (China)
- 7514 1B **The key technique analysis and function configuration of MPLS OAM** [7514-34]
X. Feng, Z. Hu, Wuhan Institute of Technology (China); Y. Chen, The Second Artillery Command College (China)
- 7514 1C **The method for recovering the soft information in the protocol stacks in type of WIFI and WIMAX** [7514-19]
Y. Tian, Huazhong Univ. of Science and Technology (China); M. Kieffer, Univ. Paris-Sud 11 (France); D. Liu, Huazhong Univ. of Science and Technology (China)
- 7514 1D **Theoretical and experimental investigation of multi-wavelength fiber laser** [7514-70]
J. Wo, Q. Sun, Huazhong Univ. of Science and Technology (China)

- 7514 1E **Theoretical investigation on frequency chirp of gain-clamped wavelength converter** [7514-80]
C. Ke, B. Zhao, D. Liu, Wuhan National Lab. for Optoelectronics (China)
- 7514 1F **Track strain field analysis for positing FBG sensor in fiber optic axle detecting** [7514-68]
J. Pan, W. Li, Wuhan Univ. of Technology (China); Y. Zhang, Zhongbei Signal Software Co. Ltd. (China)
- 7514 1G **Wavelength division multiplex optical fiber Bragg grating temperature array for ocean detection** [7514-04]
X. Li, Z. Yang, Y. Li, H. Fan, North China Electric Power Univ. (China)
- 7514 1H **HDMI optical extender based on parallel optical transmitter and receiver** [7514-38]
Z. Luo, Huazhong Univ. of Science and Technology (China); Z. Zhu, H. Zhang, Wuhan Broadcasting & Television Bureau (China)
- 7514 1I **Optical phase transmultiplexing to support traffic grooming in transparent optical networks (Invited Paper)** [7514-100]
G.-W. Lu, National Institute of Information and Communications Technology (Japan)

Author Index

Symposium Committees

General Conference Chairs

Chaohui Ye, Chinese Academy of Sciences (China) and Wuhan National Laboratory for Optoelectronics (China)

Ahmed H. Zewail, 1999 Nobel Prize Winner in Chemistry; Physical Biology Center for Ultrafast Science and Technology, California Institute of Technology (United States)

Bingkun Zhou, Chinese Academy of Sciences (China) and Tsinghua University (China)

International Advisory Committee

Peigen Li, Chair, Huazhong University of Science and Technology (China)

Victor V. Apollonov, General Physics Institute (Russian Federation)

Hegao Cai, Harbin Institute of Technology (China)

Britton Chance, Pennsylvania University (United States)

Ruiliang Chen, Université Laval (Canada)

Yong Chen, Ecole Normale Supérieure (France)

Yi-Bing Cheng, Monash University (Australia)

Connie Chang-Hasnain, University of California, Berkeley (United States)

Russell D. Dupuis, Georgia Institute of Technology (United States)

Don Giddens, Georgia Institute of Technology (United States)

Michael Grätzel, Ecole Polytechnique Fédérale de Lausanne (Switzerland)

Dianyu Fan, Shanghai Institute of Optics and Fine Mechanics (China)

Xun Hou, Xi'an Institute of Optics and Precision Mechanics (China)

Desheng Jiang, Wuhan University of Technology (China)

Tingye Li, AT&T Labs (retired) (United States)

Songhao Liu, South China Normal University (China)

Jurgen Michel, Massachusetts Institute of Technology (United States)

David A.B. Miller, Stanford University (United States)

Liwei Lin, University of California, Berkeley (United States)

Bo Liu, National Data Storage Institute (Singapore)

Mike O'Mahony, University of Essex (United Kingdom)
Hanben Niu, Shenzhen University (China)
Zihe Rao, Nankai University (China)
Xubang Shen, Chinese Academy of Sciences (China)
Kang L. Wang, University of California, Los Angeles (United States)
Naiyan Wang, Institute of Atomic Energy (China)
Lihong Wang, Washington University in St. Louis (United States)
Qiming Wang, Institute of Semiconductors, Chinese Academy of Sciences (China)
Ian H. White, University of Cambridge (United Kingdom)
Bernd Wilhelmi, Friedrich-Schiller-Universität Jena (Germany)
C. P. Wong, Georgia Institute of Technology (United States)
Ke Wu, Université de Montréal (Canada)
Zhizhan Xu, Shanghai Institute of Optics and Fine Mechanics (China)
X. C. Zhang, Rensselaer Polytechnic Institute (United States)
Zisen Zhao, Fiberhome (China) and Wuhan Research Institute (China)
Bingkun Zhou, Tsinghua University (China)
Jimmy Zhu, Carnegie Mellon University (United States)
Zhongliang Zhu, Chinese Academy of Sciences (China)

Program Committee

Qingming Luo, *Chair*, Wuhan National Laboratory for Optoelectronics (China)
Hiroshi Amano, Meijo University (Japan)
Chin Hsin Chen, National Chiao Tung University (Taiwan, China)
Yong Chen, École Normale Supérieure Paris, CNRS (France)
Dianyan Fan, Shanghai Institute of Optics and Fine Mechanics (China)
Fuxi Gan, Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China)
Michael Grätzel, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
Dieter Stefan Jäger, Universität Duisburg-Essen (Germany)
Shuisheng Jian, Chinese Academy of Sciences (China)
Desheng Jiang, Chinese Academy of Engineering (China)
Masud Mansuripur, College of Optical Sciences, The University of Arizona (United States)
Valery V. Tuchin, Saratov State University (Russian Federation)
Lihong Wang, Washington University in St. Louis (United States)
Horst Weber, Technische Universität Berlin (Germany)

Hequan Wu, Chinese Academy of Engineering (China)
Changsheng Xie, Wuhan National Laboratory for Optoelectronics (China)
Jianquan Yao, Tianjing University (China) and Wuhan National Laboratory for Optoelectronics (China)
Zisen Zhao, Fiberhome (China) and Wuhan Research Institute (China)

Local Organizing Committee

Lin Lin, *Chair*, Wuhan National Laboratory for Optoelectronics (China)
Yaming Xia, *Chair*, Administration Committee of Wuhan East Lake Hi-tech Development Zone (China)
Changqing Chen, Wuhan National Laboratory for Optoelectronics (China)
Huafen Chen, Administration Committee of Wuhan East Lake Hi-tech Development Zone (China)
Ling Fu, Wuhan National Laboratory for Optoelectronics (China)
Dongsheng Jiang, State Key Laboratory of Solid State Lasers (China)
Pengcheng Li, Wuhan National Laboratory for Optoelectronics (China)
Deming Liu, Wuhan National Laboratory for Optoelectronics (China)
Xiangshui Miao, Wuhan National Laboratory for Optoelectronics (China)
Junqiang Sun, Wuhan National Laboratory for Optoelectronics (China)
Qianwen Sun, Administration Committee of Wuhan East Lake Hi-tech Development Zone (China)
Peng Wang, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences (China)
Jinzhong Yu, Institute of Semiconductors, Chinese Academy of Sciences (China)
Xiao Zhu, Wuhan National Laboratory for Optoelectronics (China)

Conference Committee

Conference Chairs

Dieter Stefan Jäger, Universität Duisburg-Essen (Germany)
Hequan Wu, Chinese Academy of Engineering (China)
Shuisheng Jian, Beijing Jiaotong University (China)
Desheng Jiang, Wuhan University of Technology (China)
Deming Liu, Huazhong University of Science and Technology (China)

Program Committee

Jianping Chen, Shanghai Jiao Tong University (China)
Robert M. Kolbas, North Carolina State University (United States)
Yadong Jiang, University of Electronic Science and Technology (China)
Wei Jin, The Hong Kong Polytechnic University (Hong Kong, China)
Lisa Li, Inphix Company (United States)
T. F. Morse, Boston University (United States)
Li Pei, Beijing Jiaotong University (China)
Nasser Peyghambarian, University of Arizona (United States)
David V. Plant, McGill University (Canada)
Xueguang Qiao, Xibei University (China)
Yunjiang Rao, University of Electronics Science and Technology (China)
Xiaomin Ren, Beijing University of Posts and Telecommunications (China)
Ping Shum, Nanyang Technological University (Singapore)
Leping Wei, China Telecom Group Company (China)
Shizhong Xie, Tsinghua University (China)
Ying Zhang, SIM Tech (Singapore)
Guangxi Zhu, Huazhong University of Science and Technology (China)

Local Organizing Committee Chair

Deming Liu, Huazhong University of Science and Technology (China)