

PROCEEDINGS OF SPIE

International Workshop and Conference on Photonics and Nanotechnology 2007

**Preecha P. Yupapin
Wicharn Techitdheera**
Editors

**16–18 December 2007
Pattaya, Thailand**

Organized by

Department of Applied Physics, Faculty of Science, King Mongkut's Institute of Technology
Ladkrabang (Thailand)

Cooperating Organizations

SPIE

OSA—Optical Society of America (USA)

IEEE-LEOS Thailand Chapter (Thailand)

CH Karnchang Public Company Ltd. (Thailand)

National Electronics and Computer Technology Center (Thailand)

Published by

SPIE

Volume 6793

Proceedings of SPIE, 0277-786X, v. 6793

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 *International Workshop and Conference on Photonics and Nanotechnology 2007*, edited by Preecha P. Yupapin, Wicharn Techitdheera, Proceedings of SPIE Vol. 6793 (SPIE, Bellingham, WA, 2008) Article CID Number.

ISSN 0277-786X
ISBN 9780819469588

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 © 2008, 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/08/\$18.00.

Printed in the United States of America.

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

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

- vii *Conference Committees*
ix *Preface*
- 6793 02 **Nonlinear effects in optical fibers: limitations and benefits (Keynote Paper)** [6793-01]
M. F. S. Ferreira, Univ. of Aveiro (Portugal)
- 6793 03 **Method for generating and measuring static and dynamic small forces (Invited Paper)**
[6793-02]
Y. Fujii, Gunma Univ. (Japan)
- 6793 04 **Negative differential capacitance of AlGaIn/GaN heterostructure in presence of InN quantum dots** [6793-03]
A. Asgari, Univ. of Tabriz (Iran)
- 6793 05 **Particle tracking from in-line holograms by using single wavelet coefficient** [6793-04]
S. Soontaranon, J. Widjaja, Suranaree Univ. of Technology (Thailand)
- 6793 06 **Widely tunable ultraviolet C generation using wavelength selective external high-Q-cavity and a blue laser diode system** [6793-05]
C. Tangtrongbenchasil, K. Nonaka, Kochi Univ. of Technology (Japan)
- 6793 07 **Propagation characteristics of a random-metal dielectric film for an optical near-field generator (Invited Paper)** [6793-06]
A. Utsumi, M. Fukuda, Toyohashi Univ. of Technology (Japan)
- 6793 08 **Application of reflection-spectrum envelope for sampled gratings** [6793-07]
X. He, Huazhong Univ. of Science and Technology (China) and The Hong Kong Polytechnic Univ. (Hong Kong China); D. N. Wang, The Hong Kong Polytechnic Univ. (Hong Kong China); D. Huang, Y. Yu, Huazhong Univ. of Science and Technology (China)
- 6793 09 **Estimation of coupling power parameter of fused coupled fibers** [6793-08]
Saktioto, Univ. of Riau (Indonesia); J. Ali, Univ. Teknologi Malaysia (Malaysia); M. Fadhali, Ibb Univ. (Yemen); J. Zainal, Univ. Teknologi Malaysia (Malaysia)
- 6793 0A **Dynamic displacement measurements with a dual-cavity fiber Fabry-Perot interferometer**
[6793-09]
S. Pullteap, H. C. Seat, Lab. d'Optoélectronique pour les Systèmes Embarqués, ENSEEIHT-INPT (France)
- 6793 0B **Improving the opal-based photonic crystals by noise-assisted crystallisation** [6793-10]
W. Khunsin, G. Kocher, S. G. Romanov, Univ. College Cork (Ireland); C. M. Sotomayor Torres, Univ. College Cork (Ireland), Institutió Català de Recerca i Estudis Avançats (Spain), and Catalan Institute of Nanotechnology (Spain)

- 6793 0C **Temperature-dependent photoluminescence investigation of narrow well-width InGaAs/InP single quantum well** [6793-11]
W. Pecharapa, W. Techitheera, P. Thanomgam, J. Nukeaw, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 0D **The effect of nanotechnology on education** [6793-12]
C. Viriyavejakul, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 0E **Q-factor and waveguide-sphere separation effects in waveguide-coupled microsphere resonators** [6793-13]
Y. Panitchob, G. Senthil Murugan, M. N. Zervas, J. S. Wilkinson, Univ. of Southampton (United Kingdom)
- 6793 0F **Steady state numerical model of a Q-switched double-clad fiber laser** [6793-14]
S. A. S. Zyabari, Islamic Azad Univ. of Iran (Iran); A. Zarifkar, Iran Telecommunication Research Ctr. (Iran)
- 6793 0G **Mode matching for efficient laser diode to single mode fiber coupling** [6793-15]
M. Fadhali, Saktioto, J. Zainal, Y. Munajat, J. Ali, R. Abdul Rahman, Univ. Technology Malaysia (Malaysia)
- 6793 0H **Toward single molecule detection through tip-enhanced near-field Raman spectroscopy (Invited Paper)** [6793-16]
P. Verma, T. Ichimura, T. Yano, Y. Inouye, Osaka Univ. (Japan); S. Kawata, Osaka Univ. (Japan) and RIKEN (Japan)
- 6793 0I **Electrical and optical properties of Al doped ZnO film prepared by spray pyrolysis technique** [6793-17]
S. P. Shrestha, Tribhuvan Univ. (Nepal) and Abdus Salam International Ctr. for Theoretical Physics (Italy); P. Basnet, Tribhuvan Univ. (Nepal)
- 6793 0J **Determination of the optical constants and thickness of titanium oxide thin film by envelope method** [6793-18]
N. Witit-anun, P. Rakkwamsuk, P. Limsuwan, King Mongkut's Institute of Technology Thonburi (Thailand)
- 6793 0K **Electrical spin injection from an iron-rich iron-platinum thin film into gallium arsenide** [6793-19]
A. Sinsarp, Mahidol Univ. (Thailand) and National Institute of Advanced Industrial Science and Technology (Japan); T. Manago, Tokyo Univ. of Science (Japan); F. Takano, H. Akinaga, National Institute of Advanced Industrial Science and Technology (Japan)
- 6793 0L **Shooting method calculation of temperature dependence of transition energy for quantum well structure** [6793-20]
B. Jukgoljun, W. Pecharapa, W. Techitdheera, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 0M **Design of optical ring resonator filters for WDM applications** [6793-21]
P. Saeung, P. P. Yupapin, King Mongkut's Institute of Technology Ladkrabang (Thailand)

- 6793 ON **An optical tunable band-pass filter using chaotic signals in a nonlinear micro-ring resonator** [6793-22]
P. P. Yupapin, W. Suwancharoen, S. Pipatsart, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 OO **An aerosol optical thickness investigation in the Suvarnabhumi Airport using an inexpensive sunphotometer** [6793-23]
K. Udomwech, P. P. Yupapin, S. Pipatsart, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 OP **An alternative optical switch using Mach Zehnder interferometer and two ring resonators** [6793-24]
P. P. Yupapin, P. Saeung, King Mongkut's Institute of Technology Ladkrabang (Thailand); P. Chunpang, Mahasarakham Univ. (Thailand)
- 6793 OQ **The entangled photon regeneration and characterization in a nonlinear fiber ring resonator incorporating an erbium-doped fiber** [6793-25]
W. Khunnam, P. P. Yupapin, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 OR **Chaotic signal filtering device using a serial connection of micro-ring resonators** [6793-26]
P. P. Yupapin, W. Suwancharoen, S. Chaiyasoonthorn, S. Thongmee, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 OS **Nonlinear effects in fiber grating to nano-scale measurement resolution** [6793-27]
P. Phiphithirankarn, P. Yabosdee, P. P. Yupapin, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 OT **Quantum chaotic signals generated by a nonlinear micro-ring resonator** [6793-28]
C. Sripakdee, W. Suwancharoen, P. P. Yupapin, King Mongkut's Institute of Technology Ladkrabang (Thailand)
- 6793 OU **Photorefractive effect in Pb-based relaxor ferroelectric materials** [6793-29]
S. Suttirak, P. Buranasiri, King Mongkut's Institute of Technology Ladkrabang (Thailand); P. P. Banerjee, Univ. of Dayton (USA); N. Witthayakorn, W. Neeyakorn, King Mongkut's Institute of Technology Ladkrabang (Thailand)

Author Index

Conference Committees

General Chair

Preecha P. Yupapin, King Mongkut's Institute of Technology
Ladkrabang (Thailand)

General Cochair

Wicharn Techitdheera, King Mongkut's Institute of Technology
Ladkrabang (Thailand)

International Advisory and Steering Committee

T. Achariyapaopan, Fabrinet (Thailand)
M. A. Allen, Mahidol University (Thailand)
W. Boyle, City University London (United Kingdom)
P. L. Chu, City University of Hong Kong (China)
P. Drummond, The University of Queensland (Australia)
C. Gheorghiu, T. Popavicia (Romania)
K. T. V. Grattan, City University London (United Kingdom)
W. Loeksmanto, Bandung Institute of Technology (Indonesia)
C. H. Oh, National University of Singapore (Singapore)
H. Ohno, Tohoku University (Japan)
K. Phommason, National University of Laos (PDR)
K. Weir, Imperial College London (United Kingdom)

Technical Committee

R. Chitaree, Mahidol University (Thailand)
T. Kaewdang, King Mongkut's Institute of Technology Ladkrabang
(Thailand)
J. Nukeaw, King Mongkut's Institute of Technology Ladkrabang
(Thailand)
M. Oi, Tokyo Gakugei University (Japan)
W. Pecharapa, King Mongkut's Institute of Technology Ladkrabang
(Thailand)
V. Quang, IOP (Vietnam)
A. Roeksabutr, Mahanakorn University of Technology (Thailand)
M. M. Salleh, University Kebangsaan (Malaysia)
D. N. Wang, The Hong Kong Polytechnic University (Hong Kong China)
J. Widjaja, Suranaree University of Technology (Thailand)
T. Wongchareun, Bangkok University (Thailand)
L. Yong-Hee, Korea Advanced Institute of Science and Technology
(South Korea)

Preface

The papers published in this SPIE volume were presented at the International Conference on Photonics and Nanotechnology (ICPN-2007), that took place 16–18 December 2007, in Pattaya, Thailand. The conference was organized by the Department of Applied Physics, Faculty of Science, King Mongkut's Institute of Technology Ladkrabang (KMITL), Thailand. The event was supported by SPIE, OSA—Optical Society of America, IEEE-LEOS-Thailand, CH Karnchang (Thailand), NECTEC (Thailand), and the Department of Applied Physics, Faculty of Science, KMIL, Thailand.

Twenty-nine papers were selected for publication in this volume. The papers were selected by the ICPN-2007 committee from the 60 submitted manuscripts. The published papers have been edited and modified by the corresponding authors of the presented papers, and finally, edited by the editors of this volume. The technical quality of the papers was carefully reviewed and edited before publication in these proceedings.

We would also like to thank all contributing authors for their quality work and expect to have this collaboration again in the next two years.

Preecha P. Yupapin

