PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 7730

, "Front Matter: Volume 7730," Proc. SPIE 7730, Optical Data Storage 2010, 773001 (6 October 2010); doi: 10.1117/12.869027

SPIE.

Event: Optical Data Storage 2010, 2010, Boulder, Colorado, United States

PROCEEDINGS OF SPIE

Optical Data Storage 2010

Susanna Orlic
Ryuichi Katayama
Editors

23–26 May 2010
Boulder, Colorado, United States

Sponsored by
SPIE
IEEE Photonics Society
Optical Society of America

Published by
SPIE

Volume 7730

Proceedings of SPIE, 0277-786X, v. 7730

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 *Optical Data Storage 2010*, edited by Susanna Orlic, Ryuichi Katayama, Proceedings of SPIE Vol. 7730 (SPIE, Bellingham, WA, 2010) Article CID Number.

ISSN 0277-786X
ISBN 9780819482198

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 © 2010, 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/10/\$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*

HOLOGRAPHIC RECORDING/TECHNIQUES

- 7730 03 **Construction of holographic data storage system with dual-reference beam** [7730-02]
K. Watabe, H. Okano, T. Usui, A. Ogawa, S. Tatsuta, Y. Kubota, Toshiba Corp. (Japan)
- 7730 04 **Experimental investigation of a page-oriented Lippmann holographic data storage system**
[7730-03]
G. Pauliat, K. Contreras, Lab. Charles Fabry de l'Institut d'Optique, CNRS, Univ. Paris-Sud
(France)
- 7730 05 **Digital holographic recording using spatially resolved multiwavelengths** [7730-04]
S. Huferath-von Luepke, C. von Kopylow, J. Geldmacher, Th. Kreis, Bremer Institut für
angewandte Strahltechnik (Germany)

MICROHOLOGRAPHIC RECORDING

- 7730 08 **Microholographic recording with wavelength and angle multiplexing** [7730-07]
R. Katayama, NEC Avio Infrared Technologies Co., Ltd. (Japan); Y. Komatsu, NEC Network
and Sensor Systems, Ltd. (Japan)

DRIVE TECHNOLOGIES AND COMPONENTS

- 7730 0C **Development of compact femtosecond fiber laser and alignment free confocal system for
multilayered optical memory (Invited Paper)** [7730-11]
Y. Kawata, Shizuoka Univ. (Japan) and Japan Science and Technology Agency (Japan);
M. Tsuji, Shizuoka Univ. (Japan); W. Inami, Shizuoka Univ. (Japan) and Japan Science and
Technology Agency (Japan)
- 7730 0D **512 GB recording on 16-layer optical disc with Blu-ray Disc based optics (Invited Paper)**
[7730-12]
M. Inoue, A. Kosuda, K. Mishima, T. Ushida, T. Kikukawa, TDK Corp. (Japan)
- 7730 0E **Homodyne detection for readout signals of optical disc with a high-coherence laser**
[7730-13]
K. Osawa, H. Mikami, T. Kurokawa, K. Watanabe, Hitachi, Ltd. (Japan)
- 7730 0F **Angle and phase coding in optical recording** [7730-14]
S. F. Pereira, Technische Univ. Delft (Netherlands); J. F. P. Spronck, Yale Univ. (United States);
V. G. Kutchoukov, Technische Univ. Delft (Netherlands); H.-A. Bachor, The Australian
National Univ. (Australia)

NEAR-FIELD RECORDING

- 7730 OK **High density recording with SIL-based near-field optical recording (Invited Paper)** [7730-19]
J.-H. Kim, S.-H. Lee, J.-K. Seo, LG Electronics Inc. (Korea, Republic of)
- 7730 OM **Characteristics of the depth of focus in a high-NA optical system with a SIAX for data storage** [7730-21]
J. Kim, Myongji Univ. (Korea, Republic of); M. Kim, S. Hong, Seoul National Univ. (Korea, Republic of); T. D. Milster, College of Optical Sciences, The Univ. of Arizona (United States)

SUPER RESOLUTION AND HYBRID SYSTEMS

- 7730 ON **Near-field optical transducer design with FePt recording media for multiple Tb/in² density heat assisted magnetic recording** [7730-22]
B. X. Xu, Y. T. Toh, C. W. Chia, J. F. Hu, G. G. Vienne, C. W. An, Y. Yosia, T. C. Chong, A*STAR - Data Storage Institute (Singapore)
- 7730 OP **All-optical magnetic recording and its thermal issues** [7730-24]
J. M. Li, L. P. Shi, G. Q. Yuan, K. G. Lim, G. Vienne, K. Eason, J. Zhang, T. C. Chong, A*STAR - Data Storage Institute (Singapore)
- 7730 OQ **Property study of TbFeCo for all-optical magnetic recording** [7730-25]
M. L. Lee, A*STAR - Data Storage Institute (Singapore); C. H. Lim, K. L. Toh, C. L. Gan, Nanyang Technological Univ. (Singapore); J. M. Li, L. P. Shi, A*STAR - Data Storage Institute (Singapore)
- 7730 OR **Optical channel characterization for an InSb-based super-resolution disc system** [7730-26]
D. Hepper, G. Pilard, X.-M. Chen, C. Féry, Deutsche Thomson oHG (Germany)

HOLOGRAPHIC RECORDING/COMPONENTS AND MEDIA

- 7730 OT **Enhancement of a tunable blue laser for holographic data storage** [7730-28]
M. Omori, H. Kondo, T. Miyata, N. Mori, H. Matsuo, T. Sasamuro, S. Okauchi, Nichia Corp. (Japan); J. Ensher, R. Harris, A. Wegner, J. Cozacos, InPhase Technologies Inc. (United States)
- 7730 OU **A laser module for holographic data storage** [7730-29]
J. Ensher, A. Wegner, J. Cozacos, R. Mandeville, InPhase Technologies Inc. (United States)
- 7730 OW **Background correction of detected digital data page for holographic storage** [7730-31]
S. Solanki, X. Xu, X. Liang, A*STAR - Data Storage Institute (Singapore); T.-C. Chong, A*STAR - Data Storage Institute (Singapore) and National Univ. of Singapore (Singapore)
- 7730 OX **Blends of azobenzene-containing diblock copolymers and molecular glasses for holographic data storage** [7730-32]
H. Audorff, R. Walker, L. Kador, H.-W. Schmidt, Univ. Bayreuth (Germany)

FUTURE EMERGING TECHNOLOGIES

- 7730 0Z **State of R&D in photonics-related fields in Japan's industry and academia: leading the green digital economy (Invited Paper)** [7730-34]
K. Tatsuno, OITDA/Hitachi, Ltd. (Japan)

NANOPHOTONICS

- 7730 15 **Single spins in diamond for quantum networks and magnetic sensing (Invited Paper)** [7730-41]
M. V. G. Dutt, Univ. of Pittsburgh (United States) and Harvard Univ. (United States)

MULTIDIMENSIONAL RECORDING

- 7730 18 **Two-photon sensitized recording materials for multilayer optical disk (Invited Paper)** [7730-44]
M. Akiba, E. Goto-Takahashi, H. Takizawa, T. Sasaki, H. Mochizuki, T. Mikami, T. Kitahara, FUJIFILM Corp. (Japan)

ADVANCED AND RELATED TECHNOLOGIES

- 7730 1C **Full high-definition digital 3D holographic display and its enabling technologies (Invited Paper)** [7730-48]
X. Xu, S. Solanki, X. Liang, Y. Pan, A*STAR - Data Storage Institute (Singapore); T.-C. Chong, A*STAR - Data Storage Institute (Singapore) and National Univ. of Singapore (Singapore)

POST-DEADLINE SESSION

- 7730 1D **Optical phase multi-level recording in microhologram** [7730-68]
H. Mikami, K. Osawa, K. Watanabe, Hitachi, Ltd. (Japan)

POSTER SESSION

- 7730 1F **Readout signal intensity for the two-photon sensitized fluorescent recording materials** [7730-49]
T. Sasaki, T. Mikami, H. Mochizuki, T. Kitahara, M. Akiba, E. Goto-Takahashi, H. Takizawa, FUJIFILM Corp. (Japan)
- 7730 1H **Signal quality improvement of holographic data storage by adaptive two-dimensional filter** [7730-51]
Y. Kondo, Y. Takahata, S. Yoshida, M. Yamamoto, Tokyo Univ. of Science (Japan)
- 7730 1J **A numerical model for superresolution effect in optical discs** [7730-53]
A. C. Assafrao, S. F. Pereira, H. P. Urbach, Technische Univ. Delft (Netherlands); C. Fery, L. von Riewel, S. Knappmann, Deutsche Thomson oHG (Germany)

- 7730 1L **The study on mechanism of holographic recording in photopolymer with dual monomer** [7730-56]
Q. Zhai, S. Tao, D. Wang, Beijing Univ. of Technology (China)
- 7730 1N **Analysis of the plastic substrates, the reflective layers, and the adhesives of today's archival-grade DVDs** [7730-58]
G. Jiang, F. Rivera, S. S. Kanyal, R. C. Davis, R. Vanfleet, B. M. Lunt, M. R. Linford, Brigham Young Univ. (United States)
- 7730 1O **Error reduction in reconstruction of kinoform CGH patterns for a hologram ID tag system** [7730-59]
H.-R. Kim, K.-M. Pak, J.-S. Lim, Y.-H. Won, KAIST (Korea, Republic of)
- 7730 1P **Color computer-generated hologram for larger data capacity** [7730-60]
H.-W. Choi, K.-W. Jun, Y.-H. Won, KAIST (Korea, Republic of)
- 7730 1Q **Improved readout system for multilevel signal waveform modulation read-only disc** [7730-61]
H. Wang, H. Xu, J. Pei, L. Pan, Tsinghua Univ. (China)
- 7730 1R **New developments of the signal waveform modulation optical disc** [7730-62]
H. Liu, Tsinghua Univ. (China) and Yanshan Univ. (China); J. Pei, L. Pan, Y. Ni, Tsinghua Univ. (China)
- 7730 1S **Fano resonance in silver-silica-silver multilayer nanoshells** [7730-63]
J. F. Ho, B. Luk'yanchuk, J. B. Zhang, A*STAR - Data Storage Institute (Singapore)
- 7730 1U **DVD error evaluation: are PI8(max) and POF(max) enough?** [7730-65]
B. M. Lunt, E. Bourgeois, B. M. Lunt, Brigham Young Univ. (United States); M. Worthington, Millenniata, Inc. (United States)
- 7730 1V **Investigation on influence of wavefront property of reference beams on the quality of images reconstructed from holograms** [7730-66]
W. Song, S. Tao, D. Wang, Beijing Univ. of Technology (China)
- 7730 1W **Optically induced spin-orbit effective magnetic fields in all-optical magnetic recording** [7730-67]
K. Eason, G. Vienne, J. M. Li, A*STAR - Data Storage Institute (Singapore)

Author Index

Conference Committees

Organizing Committee General Chairs

Robert R. McLeod, University of Colorado at Boulder (United States)
In-Ho Choi, LG Electronics Inc. (Korea, Republic of)

Program Committee Chairs

Susanna Orlic, Technische Universität Berlin (Germany)
Ryuichi Katayama, NEC Avio Infrared Technologies Ltd. (Japan)

Program Committee

Vijayakumar Bhagavatula, Carnegie Mellon University (United States)
Lambertus Hesselink, Stanford University (United States)
Tzuan-Ren (Steven) Jeng, Industrial Technology Research Institute (Taiwan)
Kyung-Geun Lee, Samsung Electronics Company, Ltd. (Korea, Republic of)
Masud Mansuripur, College of Optical Sciences, The University of Arizona (United States)
Hiroyuki Minemura, Hitachi, Ltd. (Japan)
Long-fa Pan, Tsinghua University (China)
Kenji Tanaka, Sony Corporation (Japan)
Kazuo Watabe, Toshiba Corporation (Japan)
Paul J. Wehrenberg, Apple Computer, Inc. (United States)
Hisayuki Yamatsu, Sony Corporation (Japan)

Advisory Committee Chairs

Kevin R. Curtis, InPhase Technologies Inc. (United States)
Luping Shi, A*STAR - Data Storage Institute (Singapore)

Advisory Committee

Bernard W. Bell, Jr., Optical Wizards LLC (United States)
Chong Tow Chong, A*STAR - Data Storage Institute (Singapore)
Der-Ray Huang, National Dong Hwa University (Taiwan)
Joo-Ho Kim, Samsung Electronics Company, Ltd. (Korea, Republic of)
Seiji Kobayashi, Sony Corporation (Japan)
Takeshi Maeda, Japan Science and Technology Agency (Japan)
Thomas D. Milster, College of Optical Sciences, The University of Arizona (United States)
Naoyasu Miyagawa, Panasonic Corporation (Japan)
Michael P. O'Neill, Cellular Bioengineering, Inc. (United States)
Young-Pil Park, Yonsei University (Korea, Republic of)

Tim Rausch, Seagate Technology LLC (United States)
Kimihiro Saito, Sony Corporation (Japan)
Barry H. Schechtman, Information Storage Industry Consortium
(United States)
Tuviah E. Schlesinger, Carnegie Mellon University (United States)
Takashi Shimano, Hitachi Maxwell Ltd. (Japan)
Yun Sup Shin, LG Electronics Inc. (Korea, Republic of)
Din Ping Tsai, National Taiwan University (Taiwan)

Session Chairs

Opening Remarks

Susanna Orlic, Technische Universität Berlin (Germany)
Ryuichi Katayama, NEC Avio Infrared Technologies Company, Ltd.
(Japan)

Holographic Recording/Techniques

Lambertus Hesselink, Stanford University (United States)
Ryuichi Katayama, NEC Avio Infrared Technologies Company, Ltd.
(Japan)

Microholographic Recording

Robert R. McLeod, University of Colorado at Boulder (United States)
Kimihiro Saito, Sony Corporation (Japan)

Drive Technologies and Components

Kevin R. Curtis, InPhase Technologies Inc. (United States)

Systems and Applications

Barry H. Schechtman, Information Storage Industry Consortium
(United States)

Near-Field Recording

Eric J. Black, Carnegie Mellon University (United States)

Super Resolution and Hybrid Systems

Tim Rausch, Seagate Technology LLC (United States)
LuPing Shi, A*STAR - Data Storage Institute (Singapore)

Holographic Recording/Components and Media

Susanna Orlic, Technische Universität Berlin (Germany)
Kazuo Watabe, Toshiba Corporation (Japan)

Future Emerging Technologies

Paul J. Wehrenberg, Apple Computer, Inc. (United States)

Nanophotonics

Ding Ping Tsai, National Taiwan University (Taiwan)

Susanna Orlic, Technische Universität Berlin (Germany)

Multidimensional Recording

Tom D. Milster, College of Optical Sciences, The University of Arizona
(United States)

Advanced and Related Technologies

Ryuichi Katayama, NEC Avio Infrared Technologies Company, Ltd.
(Japan)

Post-deadline Session

Bernard W. Bell, Jr., Optical Wizards LLC (United States)