

PROCEEDINGS OF SPIE

Optical Design and Testing V

Yongtian Wang

Chunlei Du

Hong Hua

Kimio Tatsuno

H. Paul Urbach

Editors

5–7 November 2012

Beijing, China

Sponsored by

SPIE

COS—Chinese Optical Society

Cooperating Organizations

Tsinghua University (China) • Peking University (China) • Zhejiang University (China) • Beijing Institute of Technology (China) • Beijing University of Posts and Telecommunications (China) • University of Science and Technology of China (China) • Tianjin University (China) • Nankai University (China) • Changchun University of Science and Technology (China) • University of Shanghai for Science and Technology (China) • Capital Normal University (China) • Huazhong University of Science and Technology (China) • Beijing Jiaotong University (China) • Shanghai Institute of Optics and Fine Mechanics (China) • Changchun Institute of Optics and Fine Mechanics (China) • Institute of Semiconductors (China) • Institute of Optics and Electronics (China) • Institute of Physics (China) • Shanghai Institute of Technical Physics (China) • China Instrument and Control Society (China) • Optoelectronics Technology Committee, COS (China) • SPIE National Committee in China (China) • Japan Optical Society (Japan) • Korea Optical Society (Korea, Republic of) • Australia Optical Society (Australia) • Singapore Optical Society (Singapore)

Supporting Organizations

CAST—China Association for Science and Technology (China)

NSFC—National Nature Science Foundation (China)

Published by

SPIE

Volume 8557

Proceedings of SPIE 0277-786X, V.8557

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

Optical Design and Testing V, edited by Yongtian Wang, Chunlei Du, Hong Hua, Kimio Tatsuno, H. Paul Urbach,
Proc. of SPIE Vol. 8557, 855701 · © 2012 SPIE · CCC code: 0277-786/12/\$18 · doi: 10.1117/12.2016782

Proc. of SPIE Vol. 8557 855701-1

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 Design and Testing V*, edited by Yongtian Wang, Chunlei Du, Hong Hua, Kimio Tatsuno, H. Paul Urbach, Proceedings of SPIE Vol. 8557 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN: 0277-786X

ISBN: 9780819493125

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 © 2012, 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/12/\$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 as 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

- xi *Symposium Committees*
- xiii *Conference Committee*
- xv *Quantum dot lasers and relevant nanoheterostructures (Plenary Paper) [8552-1]*
A. E. Zhukov, N. V. Kryzhanovskaya, A. V. Savelyev, A. M. Nadtochiy, E. M. Arakcheeva,
F. I. Zubov, V. V. Korenev, Saint Petersburg Academic Univ. (Russian Federation);
M. V. Maximov, Y. M. Shernyakov, M. M. Kulagina, I. A. Slovinskiy, Ioffe Physical-Technical
Institute (Russian Federation); D. A. Livshits, Innolume GmbH (Germany); A. Kapsalis,
C. Mesaritakis, D. Syvridis, Univ. of Athens (Greece); A. Mintairov, Univ. of Notre Dame
(United States)

SESSION 1 LIQUID OPTICS AND MICRO-OPTICS

- 8557 02 **Wafer-level micro-optics: trends in manufacturing, testing, packaging, and applications**
[8557-2]
R. Voelkel, SUSS MicroOptics SA (Switzerland); L. Gong, SUSS MicroTec Co. Ltd. (China);
J. Rieck, SUSS MicroOptics SA (Switzerland); A. Zheng, SUSS MicroTec Co. Ltd. (China)
- 8557 03 **Developing interface localized liquid dielectrophoresis for optical applications (Invited
Paper) [8557-1]**
G. McHale, Northumbria Univ. (United Kingdom); C. V. Brown, M. I. Newton, G. G. Wells,
N. Sampara, Nottingham Trent Univ. (United Kingdom)
- 8557 04 **Optical modulation of polarization state based on an etched single mode fiber with
azo-polymer overlay [8557-3]**
W. Qiu, X. Tian, Q. Zhang, B. Zhu, Univ. of Science and Technology of China (China)

SESSION 2 NEW TESTING TECHNOLOGIES

- 8557 06 **Experimental techniques for aberration retrieval with through-focus intensity images
(Invited Paper) [8557-5]**
S. F. Pereira, Technische Univ. Delft (Netherlands); A. Wiegmann, Physikalisch-Technische
Bundesanstalt (Germany); N. Kumar, A. da Costa Assafrao, A. Polo, L. Wei, S. van Haver,
Technische Univ. Delft (Netherlands)
- 8557 07 **Wave-front aberrations analysis by Zernike polynomials based on the annular sub-aperture
stitching system [8557-9]**
L. Duan, M. Hui, Beijing Institute of Technology (China); J. Deng, Shanghai Jiao Tong Univ.
(China); C. Gong, Y. Zhao, Beijing Institute of Technology (China)

- 8557 09 **Test of diffractive optical element for DUV lithography system using visible laser** [8557-8]
Z. Hu, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China); J. Zhu, Shanghai Institute of Optics and Fine Mechanics (China); B. Yang, Y. Xiao, A. Zeng, H. Huang, Shanghai Institute of Optics and Fine Mechanics (China) and Univ. of Chinese Academy of Sciences (China)
- 8557 0A **High-speed zonal wavefront sensing** [8557-7]
B. Pathak, A. Das, B. R. Boruah, Indian Institute of Technology Guwahati (India)

SESSION 3 HOLOGRAPHIC 3D DISPLAY AND 3D MODELING

- 8557 0B **3D holographic display with enlarged image using a concave reflecting mirror** [8557-15]
J. Jia, Y. Wang, J. Liu, X. Li, Y. Pan, Beijing Institute of Technology (China)
- 8557 0C **Recent progress on digital holography for 3D display (Invited Paper)** [8557-11]
H. Yoshikawa, T. Yamaguchi, Nihon Univ. (Japan)
- 8557 0E **Parallel phase-shifting digital holography system using a high-speed camera (Invited Paper)** [8557-13]
Y. Awatsuji, T. Kakue, Kyoto Institute of Technology (Japan); T. Tahara, P. Xia, Kyoto Institute of Technology (Japan) and Japan Society for the Promotion of Science (Japan); K. Nishio, S. Ura, Kyoto Institute of Technology (Japan); T. Kubota, Kubota Holography Lab. Corp. (Japan); O. Matoba, Kobe Univ. (Japan)
- 8557 0F **Three-dimensional display based on phase modulation (Invited Paper)** [8557-12]
O. Matoba, Kobe Univ. (Japan)

SESSION 4 LASER BEAM PROPAGATION

- 8557 0H **The behavior of branch points in laser propagation through atmosphere** [8557-17]
X. Ge, Anhui Institute of Optics and Fine Mechanics (China) and Shandong Univ. of Technology (China); C. Fan, X. Feng, Anhui Institute of Optics and Fine Mechanics (China); C. Li, X. Liu, L. Guo, G. Wei, Shandong Univ. of Technology (China)
- 8557 0I **Implementation of controlling the divergence angle utilizing liquid crystal optical phased array** [8557-18]
F. Xiao, L. Kong, Univ. of Electronic Science and Technology of China (China)

SESSION 5 ANALYSIS AND SIMULATION METHODS

- 8557 0J **Simulation analysis of space remote sensing image quality degradation induced by satellite platform vibration** [8557-22]
F. Yang, X. Zhang, Y. Huang, W. Hao, B. Guo, Beijing Institute of Technology (China)
- 8557 0K **New approach to cost-based tolerancing (Invited Paper)** [8557-19]
A. Yabe, Consultant (Germany)

- 8557 OL **Realization method of full-field point spread function** [8557-23]
H. Luo, Z. Cen, X. Li, Zhejiang Univ. (China)
- 8557 OM **Thermal control design of a multi-channel scanning imagery radiometer (Invited Paper)**
[8557-20]
S. Jiang, B. Hu, T. Xu, Shanghai Institute of Satellite Engineering (China); G. Wang, Shanghai
Institute of Technical Physics (China)
- 8557 ON **Description and implementation studies on field dependent wavefront aberration** [8557-21]
L. Zhang, X. Li, Z. Cen, Zhejiang Univ. (China)

SESSION 6 NOVEL OPTICAL SYSTEM DESIGN

- 8557 OO **Study on optical image stabilizing method based on the technique of deformable mirror**
[8557-26]
Y. Jiang, Beijing Institute of Technology (China); Q. Hao, X. Cheng, Tsinghua Univ. (China)
- 8557 OP **Ultra-wide to mid-wide angle 3X zoom and focus adjustable lens design for industrial video
endoscope** [8557-25]
D. Yang, GE Inspection Technologies (United States)
- 8557 OQ **Designing an all-reflective, long focus and large field of view optical system with freeform
surface** [8557-28]
Q. Wang, D. Cheng, Y. Wang, Y. Liu, Beijing Institute of Technology (China)
- 8557 OR **Optical system design for a short-wave infrared imaging spectrometer** [8557-27]
H. Huang, X. Li, Z. Cen, Zhejiang Univ. (China)
- 8557 OS **Advances in optical design and optimization of miniature zoom optics with liquid lens
element (Invited Paper)** [8557-24]
C.-M. Tsai, Kun Shan Univ. (Taiwan, China); Y.-C. Fang, National Kaohsiung First Univ. of
Science and Technology (Taiwan, China)

SESSION 7 ADVANCED SENSING AND MEASUREMENT

- 8557 OT **The measurement of optical reflector with complex surface using nano-CMM** [8557-30]
Z. Wu, T. Guo, J. Chen, X. Fu, X. Hu, Tianjin Univ. (China)
- 8557 OU **Wave-front coded optical readout for the MEMS-based uncooled infrared imaging system**
[8557-31]
T. Li, Y. Zhao, L. Dong, X. Liu, Beijing Institute of Technology (China); W. Jia, Beijing Institute
of Technology (China) and Beijing Teponteq Co., Ltd. (China); M. Hui, Beijing Institute of
Techonology (China); X. Yu, Peking Univ. (China); C. Gong, W. Liu, Beijing Institute of
Technology (China)
- 8557 OV **Measurement of the mirror reflective spectrum of typical roughness surface in the
ultraviolet band (Invited Paper)** [8557-29]
L. Bai, Z. Wu, Y. Li, Xidian Univ. (China)

SESSION 8 ADVANCES IN SPACE OPTICS

- 8557 0X **Optical design of multispectral sensor using off-axis three-mirror reflective optics** [8557-36]
T. Tang, Beijing Institute of Space Mechanics and Electricity (China)
- 8557 0Y **Design of a four mirror optical system with wide field of view** [8557-37]
A. Wei, J. Chang, L. Zhang, J. Cao, B. Shen, J. Ouyang, Beijing Institute of Technology (China)
- 8557 0Z **The effects of piston error on image quality of synthetical aperture optical imaging system** [8557-35]
J. Zhang, W. Zhao, F. Yang, L. Zhang, Beijing Institute of Technology (China)

POSTER SESSION

- 8557 11 **Design of all reflective zoom optical system of wide field of view with 3 mirrors** [8557-43]
L. Zhang, J. Chang, A. Wei, J. Cao, J. Ouyang, Beijing Institute of Technology (China)
- 8557 12 **Design of an optical system in an ultra-short throw projector using the aspheric surfaces** [8557-44]
X. Cheng, Y. Wang, Tsinghua Univ. (China); Q. Hao, Beijing Institute of Technology (China)
- 8557 13 **Prototype design of an all-reflective non-coaxial optical zooming system for space camera application without moving elements based on deformable mirror** [8557-45]
H. Zhao, Xi'an Institute of Optics and Precision Mechanics (China) and State Key Lab. of Transient Optics and Photonics (China); X. Fan, Xi'an Institute of Optics and Precision Mechanics (China); G. Zou, Xi'an Institute of Optics and Precision Mechanics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Z. Pang, Graduate Univ. of Chinese Academy of Sciences (China); W. Wang, G. Ren, Y. Su, Xi'an Institute of Optics and Precision Mechanics (China)
- 8557 14 **The design of a stepper motor control-based high-precision varifocal imaging optical system** [8557-46]
B. Xiang, Beijing Institute of Tracking and Telecommunications Technology (China)
- 8557 15 **Infrared dual-band telephoto design used in joint transform correlator** [8557-39]
D. Mu, J. Dong, C. Xu, Q. Li, Changchun Univ. of Science and Technology (China)
- 8557 16 **Design of cooled athermalized infrared telephoto lens** [8557-47]
Y. Zhang, J.-Y. Shang, Y. Xu, W.-S. Wang, Changchun Univ. of Science and Technology (China)
- 8557 19 **Compact optical imaging system for star tracker with long focal length and perfect thermal adaptability** [8557-50]
Y. Ji, R. Shi, H. He, L. Xu, X. Liu, Y. Jin, W. Shen, Soochow Univ. (China)
- 8557 1A **Optimization design and error analysis of photoelectric autocollimator** [8557-51]
L. Gao, B. Yan, M. Hu, M. Dong, Beijing Information Science and Technology Univ. (China)

- 8557 1B **Design of a front objective in a monocular zoom video microscope** [8557-52]
W. Liao, Z. Xiao, G. Chen, Guilin Univ. of Electronic Technology (China)
- 8557 1C **Design of reflective active zoom systems with four mirrors** [8557-53]
B. Shen, J. Chang, J. Ouyang, L. Zhang, A. Wei, Beijing Institute of Technology (China)
- 8557 1D **Cyclops opening-up fiber for real-time fluorescence sensing** [8557-93]
Y. Yang, Donghua Univ. (China) and Digitized Textile and Fashion Technology Engineering Ctr. of National Education Ministry (China); G. Wang, North Univ. of China (China); J. Cui, Beijing Univ. of Aeronautics and Astronautics (China)
- 8557 1E **Design of the second parallel optical path of the telescope photoelectronic imaging system** [8557-54]
X. Gao, Tianjin Univ. (China) and Liu Zhou OVM Machinery Co., Ltd. (China); G. Chen, Guilin Univ. of Electronic Technology (China); D. Yu, Tianjin Univ. (China); Z. Xiao, Liu Zhou OVM Machinery Co., Ltd. (China)
- 8557 1F **Radiation distribution measurement for forest plant canopies tracing** [8557-94]
X. Wan, North China Institute of Science and Technology (China); J. Cui, Beijing Univ. of Aeronautics and Astronautics (China); Y. Yang, Donghua Univ. (China) and Digitized Textile and Fashion Technology Engineering Ctr. of National Education Ministry (China); H. Liu, Hetai Hengye Technology Development Center Co., Ltd. (China)
- 8557 1G **Off-axis three-mirror zoom system perturbation analysis** [8557-68]
J. Ouyang, J. Chang, L. Zhang, A. Wei, B. Shen, R. Li, Beijing Institute of Technology (China)
- 8557 1I **Design and modeling of a new CO₂ laser heater for thin film deposition applications** [8557-55]
M. R. Rashidian Vaziri, F. Hajiesmaeilbaigi, M. H. Maleki, Laser and Optics Research School (Iran, Islamic Republic of)
- 8557 1J **Temperature effect on ultraviolet differential absorption cross section of SO₂** [8557-95]
W. Jin, H. Zheng, H. Li, G. Zhang, H. Ji, North China Electric Power Univ. (China)
- 8557 1K **Research on the key parameters influencing the anti-vibration capability of time-frequency-domain interferometer** [8557-83]
F. Zhang, Q. Hao, Y. Hu, Q. Zhu, Beijing Institute of Technology (China)
- 8557 1L **Optical design of solar blind ultraviolet warning system** [8557-41]
Q. Li, C. Xu, J. Dong, Changchun Univ. of Science and Technology (China)
- 8557 1M **A new type of wide spectral coverage echelle spectrometer design for ICP-AES** [8557-56]
S. Chen, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); Y. Tang, X. Bayanheshig, X. Qi, W. Zhu, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8557 1O **Designing adapted to fabricating of holographic silver gratings** [8557-42]
A. Asgari, Amirkabir Univ. of Technology (Iran, Islamic Republic of); N. P. Shabestari, Optics and Laser Research School (Iran, Islamic Republic of); H. Araghi, Amirkabir Univ. of Technology (Iran, Islamic Republic of); E. Alidokht, M. H. Maleki, Optics and Laser Research School (Iran, Islamic Republic of)

- 8557 1R **Fiber ring depolarizer with one degree of freedom** [8557-78]
T. Liu, Q. Yu, C. Wang, L. Li, S. Zhang, Shanghai Univ. (China)
- 8557 1S **Based on the method of subaperture splicing detection on spherical** [8557-87]
W. Zhao, Z. Liang, G. Pan, Beijing Institute of Technology (China)
- 8557 1T **Smile effect detection for dispersive hypersepctral imager based on the doped reflectance panel** [8557-88]
J. Zhou, Soochow Univ. (China); X. Liu, Jiaozuo Univ. (China); Y. Ji, Y. Chen, W. Shen, Soochow Univ. (China)
- 8557 1U **A practical approach for measurement of IR optical system transmissivity** [8557-79]
Y. Jian, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China); Z. Pan, S. Wang, Shanghai Institute of Technical Physics (China); Y. Wang, Y. Luo, Shanghai Institute of Technical Physics (China) and Graduate School of the Chinese Academy of Sciences (China)
- 8557 1V **Design and optimization of chopper based on Labview** [8557-97]
G. Li, Capital Normal Univ. (China); X. Wang, Electronic Technology Information Research Institute (China); L. Feng, C. Zhang, Capital Normal Univ. (China)
- 8557 1W **Evaluation of parallel phase-shifting digital holography by photon-counting method** [8557-91]
L. Miao, K. Nitta, O. Matoba, Kobe Univ. (Japan); Y. Awatsuji, Kyoto Institute of Technology (Japan)
- 8557 1X **The effect of temperature characteristic of Faraday rotator to passively demodulated all optical fiber current transformers** [8557-92]
Y. Wang, Z. Wang, S. Sun, Harbin Engineering Univ. (China)
- 8557 1Y **Research on the real-time calibration of the varifocal photoelectric imaging system** [8557-69]
B. Zhou, F. Huang, Y. Chen, Shijiazhuang Mechanical Engineering College (China)
- 8557 1Z **Accuracy analysis of surface figure fitting based on opto-mechanical-thermal technology** [8557-70]
S. Fa, L. Lin, H. Fan, W. Wang, Z. Xiang, Beijing Institute of Technology (China)
- 8557 21 **Multi-limit unsymmetrical MLIBD image restoration algorithm** [8557-71]
Y. Yang, Information Engineering Univ. (China) and Air Force Airborne Academy (China); Y. Cheng, Z. Chen, C. Bo, Air Force Airborne Academy (China)
- 8557 22 **Polarization characteristics of a linearly polarized laser beam after hollow light pipe in projectors** [8557-72]
P. Zhao, S. Zhang, Y. Wang, Y. Shi, North Univ. of China (China); X. Chen, North Univ. of China (China) and Vestfold Univ. College (Norway)
- 8557 23 **A novel optical beam deflection detection system based on aspheric lens for high-speed atomic force microscope** [8557-58]
J. Zhao, G. Shang, W. Gong, J. Yao, Beihang Univ. (China)

- 8557 24 **Parameters affecting pattern fidelity and line edge roughness under diffraction effects in optical maskless lithography using a digital micromirror device** [8557-73]
M. Seo, T. Lee, H. Kim, Tongmyong Univ. (Korea, Republic of)
- 8557 25 **Wavefront fitting with Zernike polynomials based on total variation regularization method** [8557-74]
L. Lu, Tianjin Polytechnic Univ. (China); Q. Hou, Harbin Institute of Technology (China)
- 8557 26 **Error and compensation of non-polarization splitting prism (NPBS) in single frequency laser interferometer** [8557-89]
Z. Liu, J. Yang, Harbin Engineering Univ. (China)
- 8557 27 **Design and theoretical investigation of nanograting for XUV outcoupler** [8557-59]
Y.-Y. Yang, W. Sun, L. Zhang, H.-J. Yu, X.-C. Lin, Institute of Semiconductors (China)
- 8557 28 **De-coherence characteristic of laser light caused by Mie scattering** [8557-75]
Y. Wang, P. Zhao, S. Zhang, W. Gao, North Univ. of China (China); X. Chen, North Univ. of China (China) and Vestfold Univ. College (Norway)
- 8557 2C **Research on design of a cubic conjugate phase mask having the capability of controlling the bandwidth of wave-front coding system** [8557-61]
H. Zhao, Xi'an Institute of Optics and Precision Mechanics (China) and State Key lab. of Transient Optics and Photonics (China); Y. Li, Xi'an Institute of Optics and Precision Mechanics (China)
- 8557 2D **Aberration retrieval for annular pupils using parametric model of point spread function** [8557-62]
X. Chen, W. Shen, Soochow Univ. (China)
- 8557 2E **Analysis on the effect of extinction ratio in birefringent measurement by phase-stepping method** [8557-63]
X. Zhang, H. Wang, C. He, Beijing Institute of Technology (China)
- 8557 2F **Research on surface deformation of lens fastened by adhesive under gravity load and aberration analysis** [8557-64]
S. Guan, Institute of Optics and Electronics (China) and Graduate School of the Chinese Academy of Sciences (China); T. Ma, Q. Wei, Institute of Optics and Electronics (China)
- 8557 2G **Stray light analysis of a space patrol** [8557-65]
L. Lin, H. Chen, Beijing Institute of Technology (China)
- 8557 2H **Analysis and protection of stray light for the space camera at geosynchronous orbit** [8557-66]
X. Jin, L. Lin, Beijing Institute of Technology (China)
- 8557 2I **Analysis of thermal shock strength and quality factor with infrared optical domes** [8557-67]
Y. Gao, S. Liu, Nanyang Institute of Technology (China); Y. Xu, Nanyang Institute of Technology (China) and Nanjing Univ. of Science and Technology (China); B. Chang, Nanjing Univ. of Science and Technology (China)

- 8557 2J **Fluid mechanics principle about manufacture technology of micro lens generated on needing positions** [8557-76]
J. Wu Sr., Y. Yang, K. Yu, T. Chen, Beijing Univ. of Technology (China); Y. Li, C. Wang, Chinese Astronaut Science Researching and Training Ctr. (China)
- 8557 2L **The distortion analysis and correction of two-dimensional scanning system in laser differential confocal microscopy** [8557-81]
C. Gao, D. Liu, W. Zhao, Beijing Institute of Technology (China)
- 8557 2M **Planar alignment sensor based on Rayleigh interference in two wavelengths** [8557-99]
Y. Hu, Beijing Institute of Technology (China)
- 8557 2N **Design and experimental research on miniature fiber-optic displacement sensor** [8557-32]
F. Gao, J. Yang, Harbin Engineering Univ. (China)

Author Index

Symposium Committees

General Chairs

Eustace L. Dereniak, College of Optical Sciences, The University of Arizona (United States)

Bingkun Zhou, Tsinghua University (China)

General Cochairs

Arthur Chiou, National Yang-Ming University (Taiwan, China)

Zhizhan Xu, Shanghai Institute of Optics and Fine Mechanics (China)

Jianlin Cao, China Ministry of Science and Technology (China)

Junhao Chu, Shanghai Institute of Technical Physics (China)

Technical Program Chairs

Songlin Zhuang, Shanghai University of Science and Technology (China)

Xingde Li, Johns Hopkins University (United States)

Technical Program Cochairs

Qiming Wang, Institute of Semiconductors (China)

Xu Liu, Zhejiang University (China)

Daoyin Yu, Tianjin University (China)

Qihuang Gong, Peking University (China)

Tianchu Li, National Institute of Metrology (China)

Wei Huang, Nanjing University of Posts and Telecommunications (China)

Local Organizing Committee Chair

Guangcan Guo, University of Science and Technology of China (China)

Local Organizing Committee Cochairs

Guoqiang Ni, Beijing Institute of Technology (China)
Shusen Xie, Fujian Normal University (China)
Xiaomin Ren, Beijing University of Posts and Telecommunications
(China)
Ying Gu, PLA General Hospital (China)
Huilin Jiang, Changchun University of Science and Technology
(China)

General Secretary

Qihuang Gong, Peking University (China)

Local Organizing Committee

Yan Li, Chinese Optical Society/Peking University (China)
Zhiping Zhou, Peking University (China)
Changhe Zhou, Shanghai Institute of Optics and Fine Mechanics
(China)
Qingming Luo, Huazhong University of Science and Technology
(China)
Chongxiu Yu, Beijing University of Posts and Telecommunications
(China)
Hongda Chen, Institute of Semiconductors (China)
Yongtian Wang, Beijing Institute of Technology (China)
Yiping Cui, Southeast University (China)
Xuping Zhang, Nanjing University (China)
Feijun Song, Daheng Corporation (China)
Cunlin Zhang, Capital Normal University (China)
Yanting Lu, Nanjing University (China)
Yuejin Zhao, Beijing Institute of Technology (China)
Chunqing Gao, Beijing Institute of Technology (China)
Tiegen Liu, Tianjin University (China)
Xiaocong Yuan, Nankai University (China)
Weimin Chen, Chongqing University (China)
Zhongwei Fan, Academy of Optoelectronics (China)
Hanyi Zhang, Tsinghua University (China)
Lan Wu, Zhejiang University (China)
Yongsheng Zhang, University of Science and Technology of China
(China)
Hong Yang, Peking University (China)
Xiaoying Li, Tianjin University (China)
Lin Zhai, Chinese Optical Society (China)

Conference Committee

Conference Chairs

Yongtian Wang, Beijing Institute of Technology (China)
Chunlei Du, Institute of Optics and Electronics (China)
Hong Hua, College of Optical Sciences, The University of Arizona
(United States)
Kimio Tatsuno, Hitachi, Ltd. (Japan)
H. Paul Urbach, Technische Universiteit Delft (Netherlands)

Conference Program Committee

Jian Bai, Zhejiang University (China)
Pablo Benítez, Universidad Politécnica de Madrid (Spain)
Toshihide Dohi, OptiWorks, Inc. (Japan)
Qun Hao, Beijing Institute of Technology (China)
Kyung-Hee Hong, Korea Research Institute of Standards and Science
(Korea, Republic of)
Tsuyoshi Konishi, Osaka University (Japan)
Yanqiu Li, Beijing Institute of Technology (China)
Irina L. Livshits, National Research University of Information
Technologies, Mechanics and Optics (Russian Federation)
Sung Chan Park, Dankook University (Korea, Republic of)
Xiang Peng, Shenzhen University (China)
Jannick P. Rolland, University of Rochester (United States)
Keiji Sasaki, Hokkaido University (Japan)
José Sasián, College of Optical Sciences, The University of Arizona
(United States)
Han Sen, Soochow University (China)
Han-Ping David Shieh, National Chiao Tung University (Taiwan, China)
Qiaofeng Tan, Tsinghua University (China)
Kevin P. Rolland-Thompson, Synopsys, Inc. (United States)
Sandy To, The Hong Kong Polytechnic University (Hong Kong, China)
Theo Tschudi, Technische Universität Darmstadt (Germany)
Wilhelm Ulrich, Carl Zeiss AG (Germany)

Session Chairs

- 1 Liquid Optics and Micro-Optics
Chunlei Du, Chongqing Institute of Green and Intelligent Technology
(China)
- 2 New Testing Technologies
Glen McHale, Northumbria University (United Kingdom)

- 3 Holographic 3D Display and 3D Modeling
Juan Liu, Beijing Institute of Technology (China)
- 4 Laser Beam Propagation
Silvania F. Pereira, Technische Universiteit Delft (Netherlands)
- 5 Analysis and Simulation Methods
Yongtian Wang, Beijing Institute of Technology (China)
- 6 Novel Optical System Design
Xuemin Cheng, Tsinghua University (China)
- 7 Advanced Sensing and Measurement
Yi-Chin Fang, National Kaohsiung First University of Science and
Technology (Taiwan, China)
- 8 Advances in Space Optics
Jun Chang, Beijing Institute of Technology (China)