PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 10155

, "Front Matter: Volume 10155," Proc. SPIE 10155, Optical Measurement Technology and Instrumentation, 101553Z (29 November 2016); doi: 10.1117/12.2264639

SPIE.

Event: International Symposium on Optoelectronic Technology and Application 2016, 2016, Beijing, China

PROCEEDINGS OF SPIE

Optical Measurement Technology and Instrumentation

**Sen Han
JiuBin Tan**
Editors

**9–11 May, 2016
Beijing, China**

Organized by
Chinese Society for Optical Engineering (CSOE) (China)
Photo-electronic Technology Committee, Chinese Society of Astronautics (China)
Photo-electronic Industrialization Committee, CHIA (China)
Department of Cooperation and Coordination for Industry, Academe and Research, CHIA
(China)

Sponsored by
Chinese Society for Optical Engineering (CSOE) (China)
China High-tech Industrialization Association (CHIA) (China)

Technical Co-sponsor and Publisher
SPIE

Volume 10155
Part One of Two Parts

Proceedings of SPIE 0277-786X, V. 10155

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

Optical Measurement Technology and Instrumentation, edited by Sen Han, Jiubin Tan, Proc. of SPIE
Vol. 10155, 101553Z · © 2016 SPIE · CCC code: 0277-786X/16/\$18 · doi: 10.1117/12.2264639

Proc. of SPIE Vol. 10155 101553Z-1

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers 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 these proceedings:

Author(s), "Title of Paper," in *Optical Measurement Technology and Instrumentation*, edited by Sen Han, JiuBin Tan, Proceedings of SPIE Vol. 10155 (SPIE, Bellingham, WA, 2016) Seven-digit Article CID Number.

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510607682

ISBN: 9781510607699 (electronic)

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 © 2016, 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/16/\$18.00.

Printed in China.

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. A unique citation identifier (CID) number is assigned to each article at the time of 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 and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five 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.

Contents

xix	<i>Authors</i>
xvii	<i>Conference Committees</i>
xix	<i>Introduction</i>

Part One

OPTICAL MEASUREMENT TECHNOLOGY AND INSTRUMENTATION

10155 01	Recent progress of photodetectors based on MX₂/graphene van der Waals heterostructures [10155-1]
10155 02	A design of an optoelectronic isolation device to protect the measurement system of the underwater discharge acoustic source [10155-2]
10155 03	Random errors in DIC caused by non-uniform image noise [10155-4]
10155 04	Design of a photoelastic modulator in the spin-exchange relaxation-free magnetometer [10155-5]
10155 05	Study the multi-band co-caliber infrared system optimize design and quantitative measurement [10155-6]
10155 06	Construction of dark spherical spot array using an amplitude-modulated radially polarized beam [10155-7]
10155 07	An adaptive line enhancement method for UWB proximity fuze signal processing based on correlation matrix estimation with time delay factor [10155-8]
10155 08	Research of the penetration gas methods of measuring barrier property of OLED packaging materials by mass spectrometry [10155-9]
10155 09	Discrimination of three typical amino acids using PARAFAC [10155-10]
10155 0A	Variable aberration generator using a high-order even aspheric singlet for testing optical surfaces [10155-11]
10155 0B	Q-adjusting technique applied to vertical deflections estimation in a single-axis rotation INS/GPS integrated system [10155-12]
10155 0C	Measurements of density, pressure and temperature in the middle atmosphere with Rayleigh lidar [10155-14]

10155 0D	Filtered back-projection reconstruction of photoacoustic imaging based on a modified wavelet threshold function [10155-15]
10155 0E	Evaluation of the user experience of “astronaut training device”: an immersive, VR-based, motion-training system [10155-16]
10155 0F	Random error model and experiment of fiber Bragg grating acceleration sensing system [10155-17]
10155 0G	Goos-Hänchen shifts at a resonance angle of a two-prism structure using COMSOL multiphysics [10155-19]
10155 0H	Status of astigmatism-corrected Czerny-Turner spectrometers [10155-22]
10155 0I	A FBG pulse wave demodulation method based on PCF modal interference filter [10155-25]
10155 0J	Dynamic X-ray phase imaging based on an aperture array [10155-23]
10155 0K	Refractive index sensing characteristics of D-shape double core photonic crystal fiber based on surface plasmon resonance [10155-26]
10155 0L	Novel glucose fiber sensor combining ThFBG with GOD [10155-27]
10155 0M	Optical skin friction measurement technique in hypersonic wind tunnel [10155-29]
10155 0N	An endoscope designed with 3D measurement functions [10155-32]
10155 0O	Distributed acoustic sensing system using an identical weak fiber Bragg grating array [10155-31]
10155 0P	Research on the calibration of ultraviolet energy meters [10155-30]
10155 0Q	Time-resolved fluorescence spectroscopy of oil spill detected by ocean lidar [10155-33]
10155 0R	Design on wireless auto-measurement system for lead rail straightness measurement based on PSD [10155-34]
10155 0S	A focal plane metrology system and PSF centroiding experiment [10155-35]
10155 0T	Modular interference characteristics and beat length of a two-hole photonic crystal fiber [10155-36]
10155 0U	Theoretical analysis and estimation of decorrelation phase error in digital holographic interferometry [10155-37]
10155 0V	Experimental evidence for formation mechanism of regular circular fringes [10155-38]
10155 0W	Research on method and device of non-disperse atomic fluorescence excitation light source impurity detection [10155-39]
10155 0X	Design and realization of photoelectric instrument binocular optical axis parallelism calibration system [10155-41]

- 10155 0Y **New time-domain three-point error separation methods for measurement roundness and spindle error motion** [10155-43]
- 10155 0Z **Design and experiment of an adjustable full polarization imaging measurement system** [10155-42]
- 10155 10 **Two-dimensional imaging of gas temperature and concentration based on hyperspectral tomography** [10155-44]
- 10155 11 **Tolerance analysis on diffraction efficiency and polychromatic integral diffraction efficiency for harmonic diffractive optics** [10155-46]
- 10155 12 **Multi-platform laser communication networking optical antenna system design** [10155-47]
- 10155 13 **Spectral responsivity calibration of silicon photodetectors using monochromator-based cryogenic radiometer** [10155-49]
- 10155 14 **Phase retrieval based on cosine grating modulation and transport of intensity equation** [10155-51]
- 10155 15 **Measurement system for lens thickness based on low-coherent fiber-optic interferometry** [10155-52]
- 10155 16 **Analyzing the structure of the optical path difference of the supersonic film cooling** [10155-53]
- 10155 17 **Accuracy of a reference instrument for specular gloss measurements** [10155-54]
- 10155 18 **Study of laser energy standard and establishment of calibration device** [10155-55]
- 10155 19 **Beam shaping in flow cytometry with diffractive optical elements** [10155-56]
- 10155 1A **Design of wavefront coding optical system with annular aperture** [10155-58]
- 10155 1B **Analysis of wavelength error in spectral phase shifting of digital holographic microscopy** [10155-57]
- 10155 1C **3D shape reconstruction of specular surfaces by using phase measuring deflectometry** [10155-59]
- 10155 1D **A method to enhance the measurement accuracy of Raman shift based on high precision calibration technique** [10155-60]
- 10155 1E **Injection molding lens metrology using software configurable optical test system** [10155-62]
- 10155 1F **Theoretical research and comparison of forces in optical tweezers based on ray optics method and T matrix method** [10155-63]
- 10155 1G **Experiment of inverse synthetic aperture ladar at 1.1km** [10155-64]
- 10155 1H **Vibration measurement based on the optical cross-correlation technique with femtosecond pulsed laser** [10155-66]

- 10155 1I **The simulation and experiment research of harmonic signals based on wavelength modulation spectroscopy** [10155-67]
- 10155 1J **Calibration of angle of incidence of ellipsometer by autocollimator-based method** [10155-68]
- 10155 1K **Numerical simulation research on wind field disturbance detecting with coherent laser** [10155-69]
- 10155 1L **Beam-forming oriented shape estimation of optical fiber sensor array** [10155-70]
- 10155 1M **Measurements and analysis of solar direct irradiance-meter on Dunhuang radiometric calibration sites** [10155-71]
- 10155 1N **Determining the nonlinear refractive index of fused quartz by femtosecond laser Z-scan technology** [10155-72]
- 10155 1O **Design of adjustable laser beam high-resolution particle size measuring lens** [10155-74]
- 10155 1P **Research on effect of reconstructed image quality in laser reflective tomography imaging** [10155-75]
- 10155 1Q **Measurement of excited layer thickness in highly photo-excited GaAs** [10155-76]
- 10155 1R **Development and application of an automated precision solar radiometer** [10155-79]
- 10155 1S **Application of chromatic confocal displacement sensor in measurement of tip clearance** [10155-78]
- 10155 1T **A zero-crossing point locking system in the time-of-flight measurement of femtosecond pulsed laser** [10155-82]
- 10155 1U **Development of high precision digital driver of acoustic-optical frequency shifter for ROG** [10155-83]
- 10155 1V **Experimental investigation on aero-optical aberration of shock wave/boundary layer interactions** [10155-84]
- 10155 1W **Research of spectacle frame measurement system based on structured light method** [10155-85]
- 10155 1X **A new optical flat surface measurement method based on machine vision and deflectometry** [10155-86]

Part Two

- 10155 1Y **Application of double laser interferometer in the measurement of translational stages' roll characteristics** [10155-87]
- 10155 1Z **Method for the fabrication error calibration of the CGH used in the cylindrical interferometry system** [10155-88]

- 10155 20 **Research of the chemiluminescence detection apparatus for nutrients** [10155-89]
- 10155 21 **Conoscopic polarized interference applied in measuring uniaxial axis direction of electro-optic crystal** [10155-91]
- 10155 22 **Study on application of color filters in vision system of hot forgings** [10155-92]
- 10155 23 **Influence of surface characteristics on point laser interferometer for aspheric measurement** [10155-93]
- 10155 24 **Noninvasive blood pressure measurement scheme based on optical fiber sensor** [10155-95]
- 10155 25 **The research on spindle integrated measurement method of cutting force based on fiber Bragg grating** [10155-96]
- 10155 26 **A system for diagnosis of wheat leaf diseases based on Android smartphone** [10155-97]
- 10155 27 **A new type of rapid and simple coal and other bulk commodities inventory system based on two-dimensional laser scanner** [10155-98]
- 10155 28 **A registration method for 2D blade profile** [10155-99]
- 10155 29 **Study on the consistency and repeatability of FBG packaging technology** [10155-100]
- 10155 2A **Theoretical analyses of non-diffracting beams interference in a long distance** [10155-102]
- 10155 2B **Acoustic emission detection based on distributed feedback fiber laser** [10155-101]
- 10155 2C **The system of high accuracy UV spectral radiation system** [10155-103]
- 10155 2D **3D indoor modeling using a hand-held embedded system with multiple laser range scanners** [10155-104]
- 10155 2E **A standard model eye with micro scale multilayer structure for ophthalmic optical coherence tomography equipment** [10155-105]
- 10155 2F **Research on calibration of lux meter based on integrating sphere source** [10155-106]
- 10155 2G **The study on measurement methods of phase modulation characteristics for universal liquid crystal spatial light modulator** [10155-107]
- 10155 2H **MEMS fiber-optic Fabry-Perot pressure sensor for high temperature application** [10155-108]
- 10155 2I **Fault diagnosis of the rolling bearing with optical fiber Bragg grating vibration sensor** [10155-109]
- 10155 2J **Micro spectral measurement of micro integrated filters** [10155-110]
- 10155 2K **Experimental comparative study of doublet and triplet impinging atomization of gelled fuel based on PIV** [10155-111]

10155 2L	Simulation and experiment of the nonlinear response of the InGaAs <i>p-i-n</i> photodiode under high illumination [10155-112]
10155 2M	Study on the calibration method of metrological performance of ring laser gyroscope [10155-113]
10155 2N	Target recognition method based on polarization parameters [10155-115]
10155 2O	Experimental study of a new injection mode of aluminum dust fuel of pulse detonation engine based on particle image velocity [10155-118]
10155 2P	Development on adaptive accelerated system [10155-121]
10155 2Q	Evaluation of the photoelectric performance parameters measurement for electron multiplying CCD [10155-122]
10155 2R	Real-time O₂ measurement in a cement kiln with a TDLAS analyzer [10155-123]
10155 2S	Analysis of nonlinear effects caused by TE waves propagating in two-dimensional Kerr photonic crystals [10155-125]
10155 2T	A 256×256 low-light-level CMOS imaging sensor with digital CDS [10155-126]
10155 2U	The evaluation of uncertainty about the shape of aperture on measurement of averaged LED intensity [10155-127]
10155 2V	Programming implementation of performance testing of low light level ICCD camera based on LabVIEW software [10155-130]
10155 2W	Analysis of nozzle effect on pulsed detonation engine performance based on laser absorption spectroscopy with Doppler frequency shift [10155-131]
10155 2X	Reflectivity and depth images based on time-correlated single photon counting technique [10155-132]
10155 2Y	Research on measurement method of optical transmittance of the artificial fog [10155-133]
10155 2Z	SG-t optimization and processing technology of the points cloud of the railway tank car container [10155-134]
10155 30	Design of a new type spectacle frames scanner [10155-135]
10155 31	Computed tomography measurement of 3D combustion chemiluminescence using single camera [10155-136]
10155 32	Extrinsic Fabry-Perot interferometric sensor using a polarization-switched phase interrogator [10155-137]
10155 33	Study of the performance of image restoration under different wavefront aberrations [10155-138]

- 10155 34 **Method of recognizing the high-speed railway noise barriers based on the distance image** [10155-139]
- 10155 35 **Research on measurement method of optical camouflage effect of moving object** [10155-140]
- 10155 36 **Alignment method of optical registration for multi-channel CCD camera** [10155-142]
- 10155 37 **Design of noise barrier inspection system for high-speed railway** [10155-143]
- 10155 38 **A defocus-information-free autostereoscopic three-dimensional (3D) digital reconstruction method using Direct Extraction of Disparity Information (DEDI)** [10155-144]
- 10155 39 **Wavefront reconstruction algorithm based on interpolation coefficients for radial shearing interferometry** [10155-145]
- 10155 3A **Design of spectrally tunable calibration source based on Digital Micromirror Device (DMD)** [10155-146]
- 10155 3B **Phase distortion of a probe beam transmitting through a transparent medium bulk** [10155-147]
- 10155 3C **Combining depth and gray images for fast 3D object recognition** [10155-148]
- 10155 3D **Beam hardening correction for interior tomography based on exponential formed model and radon inversion transform** [10155-149]
- 10155 3E **Simulation of laser bistatic two-dimensional scattering imaging about lambertian cylinders** [10155-151]
- 10155 3F **Use of the fluorescence of rhodamine B for the pH sensing of a glycine solution** [10155-150]
- 10155 3G **Synthetic aperture LADAR at 1550 nm: system demonstration, imaging processing and experimental result** [10155-152]
- 10155 3H **The microstructure measurement of surface defects of optical component based on digital image-plane holographic microscopy** [10155-154]
- 10155 3I **Extinction characteristic of graphite smoke for terahertz wave** [10155-153]
- 10155 3J **Object reconstruction from thermal and shot noises corrupted block-based compressive ultra-low-light-level imaging measurements** [10155-155]
- 10155 3K **Study on design and experiment of safe illumination system based on optical fiber guiding light** [10155-156]
- 10155 3L **A segmental dispersion compensation method to improve axial resolution of specified layer in FD-OCT** [10155-157]
- 10155 3M **Error analysis of standard wave-front reconstruction based on spatial light modulator** [10155-158]

10155 3N	Steady-state and time-resolved fluorescence spectroscopic studies on the interaction between bovine serum albumin and Ag-nanoparticles [10155-159]
10155 3O	Variable angle transmittance of silver grid transparent electrodes [10155-160]
10155 3P	Measurement accuracy analysis for crystal plane spacing of nitride epitaxial layer by x-ray diffraction [10155-161]
10155 3Q	Method to fabricate orthogonal crossed gratings by an interference fringe based alignment technique [10155-163]
10155 3R	Characterization of Akiyama probe applied to dual-probes atomic force microscope [10155-164]
10155 3S	Model-based x-ray energy spectrum estimation algorithm from CT scanning data with spectrum filter [10155-165]
10155 3T	Fixtureless nonrigid part inspection using depth cameras [10155-167]
10155 3U	Analysis of the mechanics and deformation characteristics of optical fiber acceleration sensor [10155-168]
10155 3V	Digital holographic imaging for diffuse-reflection metal surface with strong feature [10155-169]
10155 3W	Development of automated self-calibration spectra-radiometer [10155-170]
10155 3X	S-F graphic representation analysis of photoelectric facula focometer poroo-plate glass [10155-171]
10155 3Y	Dynamic three-dimensional shape measurement for specular freeform surfaces with the quaternary orthogonal grid fringes [10155-172]

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

An, Guofei, 3B	Deng, Pan, 0C
An, Yan, 0H	Diao, Xiaofei, 23
Bai, Hua, 0I	Ding, Haolin, 16, 1V
Bi, Chao, 1S, 22	Ding, Q. X., 2P
Bing, Junjun, 25	Ding, Xiang, 1D
Bo, Yu-ming, 3U	Ding, Zengqian, 2E
Cai, He, 3B	Dong, Dengfeng, 0R
Cai, Yuan, 2J	Dong, Keyan, 0H
Cao, Dian-sheng, 2C	Dong, Xian-Zi, 3O
Cao, Ercong, 2N	Dong, Yan-bing, 0Z
Cao, Q., 2H	Duan, Lihong, 04
Cao, Yang, 0S	Duan, Xuan-Ming, 3O
Cao, Zhenggang, 2E	Duan, Xuejie, 2X
Cao, Zhi-jie, 1O	E., Kewei, 1X, 39
Chen, Bo, 1N, 3H	Fan, Dian, 0L
Chen, Chen, 2R	Fan, Qiming, 1J
Chen, Chi, 1J	Fang, G. C., 2H
Chen, Dong, 2R	Fang, Jianguo, 1S, 22, 28
Chen, Gong, 25	Fang, Jie, 2Q
Chen, H. L., 2P	Fang, Jinyue, 01
Chen, Huacai, 3N	Feng, Qibo, 34, 37
Chen, Kun, 1C	Feng, Xiaoxuan, 1N
Chen, Li, 15	Fu, Haiwei, 0F
Chen, Nan, 2T	Fu, Jia, 16, 1V
Chen, Qian, 2Q	Fu, Ying, 27
Chen, Shanyong, 0A	Fu, Zhaohui, 08
Chen, Siyu, 3D	Fu, ZhenHai, 1F
Chen, Wei, 0C	Gan, Haiyong, 13
Chen, Wei-li, 0Z	Gao, Guilong, 1Q
Chen, Xiaodong, 1W, 30	Gao, Jianqiang, 18
Chen, Xing, 0M	Gao, Jin, 2Q
Chen, Xinhua, 1A	Gao, Ming, 3B
Chen, Ya-ping, 14	Gao, Sitian, 3P, 3R
Chen, Yiyang, 29	Gao, Yanwei, 2R
Chen, Yong-hua, 0Q	Gong, Lei, 3E
Chen, Yu-dan, 0X	Gong, Yanjun, 3E
Chen, Yujia, 29	Gu, Guohua, 2N, 2Q
Chen, Zhu, 3H	Guan, Dong, 1W, 30
Cheng, Dewen, 1E	Guo, C. J., 2P
Cheng, Hong, 14	Guo, Guangrao, 1X
Cheng, Weihai, 17, 2F	Guo, Ju guang, 05
Cheng, Zhi, 0R	Guo, Lingyu, 2N
Cheung, Chifai, 38	Guo, Xuan, 0K, 0T
Chu, Chu, 1J	Han, Jibo, 1H, 1T
Cui, Guangzhen, 2Y, 35	Han, Juhong, 3B
Cui, Jianjun, 3P	Han, Xinying, 0O
Dai, Dongkai, 0B	Han, Xuecai, 3X
Dai, Yifan, 0G	Han, Yu, 3D
Dai, Zejing, 2I	Hao, Yingming, 3C

He, Bing, 26	Li, Jianwei, 13
He, Lin, 16, 1V	Li, Jie, 0Q
He, Xingdao, 3F	Li, Junjian, 08
He, Ying, 2R	Li, Lang, 3E
Hong, Gao, 0F	Li, Le, 1K
Hong, Li-juan, 1O	Li, Lei, 3D, 3S
Hong, Yan-ji, 1I	Li, Ligang, 0S
Hou, Wenmei, 1Y	Li, Meng, 06
Hu, Haichen, 0E	Li, Meng, 07
Hu, Huizhu, 1F	Li, Mengmeng, 0L
Hu, Jianghua, 2Y	Li, Mengyang, 1X, 39
Hu, Shaoxing, 2D	Li, Ming, 1O, 2I
Hu, Wei, 2L	Li, Ning, 2K, 2O, 2W
Hu, Xiaobo, 2N	Li, Qi, 3R
Hu, Xinqi, 33	Li, Ruiya, 29
Hu, Yi-hua, 1K, 1P	Li, Shi, 3R
Hu, Yujie, 3L	Li, Shi-tao, 0K
Hu, Zhaohui, 04	Li, Shuyi, 1H, 1T
Hu, Zhixiong, 2E	Li, Tiecheng, 0P, 17, 18
Huang, Biyong, 2F	Li, Wei, 3R
Huang, Linsheng, 26	Li, Xiao-long, 0Q
Huang, Xiao-long, 2W	Li, Xin, 1M, 1R, 3W
Huang, Ya-dong, 3U	Li, Xinhang, 0H
Huang, Yao, 2M	Li, Yan, 1C
Huang, Zhen, 0D	Li, Zhengfen, 2T
Huang, Zhonghua, 07	Li, Zhenggang, 1F
Jia, P. G., 2H	Li, Zheng-lin, 0N
Jia, Yaqing, 0W	Liang, Dong, 26
Jia, Zhen'an, 0F	Liang, Lingliang, 1Q
Jian, Chaochao, 2Y	Liang, Qianqian, 27
Jian, Peng, 19	Lin, Fangsheng, 0P, 17, 2F
Jiang, Hongzhen, 21, 3H	Lin, Guan-yu, 2C
Jiang, Jingbo, 0Q	Lin, Yandong, 13
Jiang, Zhigang, 3B	Liu, Bingqian, 34, 37
Jiang, Zhuqing, 3L, 3V	Liu, Dingquan, 2J
Jin, Tao, 1Y	Liu, En-chao, 1M, 3W
Jin, Xing, 10	Liu, Feng, 0K
Ju, Aisong, 1Y	Liu, Guodong, 0D
Kang, Yan, 2X	Liu, H., 2P
Kang, Yanhui, 23	Liu, Hao, 3I
Ke, Jun, 3J	Liu, Hui, 2U
Ke, Youlong, 1Y	Liu, Jian, 2U
Kim, Chol Ryong, 34, 37	Liu, Jianguo, 0C
Kong, Mei, 1U	Liu, Jie, 0X, 3K
Lai, Lei, 0P, 17, 2F	Liu, Mingyao, 25
Li, Baoquan, 0S	Liu, Pengfei, 28
Li, Chaowei, 2Q	Liu, Qinpeng, 0F
Li, Cheng, 2U	Liu, Sheng, 0O
Li, Da, 38	Liu, Shijie, 3M
Li, Dahai, 1X, 39	Liu, Wende, 1J
Li, Derong, 19	Liu, Wenli, 1D, 2E
Li, Di, 1S, 22	Liu, Wenqing, 2R
Li, Dong, 21, 3H	Liu, Wenwen, 0Y
Li, Fang, 2B	Liu, Xianxuan, 24
Li, Fei, 1D	Liu, Xu, 21, 3H
Li, Fei, 31	Liu, Ying, 0T
Li, Fuli, 1Q	Liu, Yong, 21, 3H
Li, Guangzuo, 1G, 3G	Liu, Yunyan, 0J
Li, H., 0V	Liu, Yuqing, 0E
Li, Haitao, 0S	Liu, Zhi-shen, 0Q

Liu, Zong-kai, 3U
 Long, Li, 06
 Lu, Jinfeng, 0A
 Lu, Jun, 0X
 Lu, Xin, 0T
 Luo, Hong, 32
 Luo, Jialin, 1Y
 Lv, Qian-qian, 14
 Lv, Qinghua, 2A
 Lv, Xiao-jing, 2W
 Lv, Xuliang, 2Y
 Ma, Hua, 1N
 Ma, Le, 34, 37
 Ma, Lin, 2X
 Ma, Qisheng, 27
 Ma, Shuqing, 1L
 Ma, Xiao, 3M
 Ma, Xiaofeng, 2J
 Ma, Yong hui, 05
 Ma, Yurong, 1N
 Meng, Fangang, 3A
 Miao, Changyun, 0I
 Mo, Qingkai, 0U
 Mou, Kebing, 1Z
 Ni, Li, 2V
 Ni, Xuxiang, 20
 Ni, Zuotao, 0Q
 Nie, Jin-song, 2G
 Niu, Cong, 1L
 Niu, Sen, 3J
 Ou, Yiwu, 0L
 Pan, Jin, 2S
 Pan, Junjie, 0M
 Pan, Ming, 3T
 Pan, Rong, 2S
 Pan, Wang, 3C
 Pan, Xiao, 2O
 Peng, Gang, 0I
 Peng, Runwu, 2S
 Peng, Te, 1L
 Qian, Weixian, 2N
 Qian, Yi, 14
 Qian, Yunsheng, 2V
 Qiao, Dan, 2M
 Qin, Shiqiao, 0I
 Qiu, Gang-gang, 1R, 3W
 Qu, Dong-sheng, 1I
 Qu, Weidong, 19
 Qu, Xinghua, 22
 Qu, Yang, 35
 Ren, G., 0V
 Ren, Huan, 1N
 Ren, Mingjun, 38
 Ren, Zhong, 0D
 Rong, Xianhui, 2Y
 Shan, Mao, 1I
 Shang, Yiyuan, 2A
 Shangguan, Hongyuan, 06
 Shao, Jianda, 3M
 Shao, Li, 2G, 2L
 Shao, Shuangyun, 34, 37
 Shen, Lu, 1Y
 Shen, Weimin, 1A
 Shen, Yu, 1F
 Shen, Zhengsheng, 0W
 Shen, Ziqi, 0I
 Shi, Jia-ming, 3I
 Shi, Jiulin, 3F
 Shi, Kaixing, 3F
 Shi, Leibing, 17
 Shi, Liang, 1K, 1P
 Shi, Yarong, 3N
 Shi, Yushu, 3R
 Shi, Zhendong, 1N
 Song, Junling, 10
 Song, Ya-jun, 0Z
 Song, Ying, 2B
 Su, Yong, 03
 Sun, Xiao-quan, 2G
 Tan, Yuegang, 29
 Tang, Zhixiang, 2S
 Tao, Tingting, 0Y
 Tian, Jinshou, 1Q
 Tong, Yilin, 3X
 Wan, Minjie, 2N
 Wang, Bochen, 3L
 Wang, Chunyong, 08
 Wang, Danli, 0E
 Wang, Duhu, 2D
 Wang, Fuyin, 32
 Wang, G., 0V
 Wang, Guang-yu, 10, 11
 Wang, Hequn, 3R
 Wang, Hongyuan, 3B
 Wang, Jia-chun, 3I
 Wang, Jie, 0R, 1B
 Wang, Jun, 0B, 3U
 Wang, Junhua, 15
 Wang, Kuanliang, 3I
 Wang, Lin-Yuan, 3S
 Wang, Li-qiang, 0N
 Wang, Ming-dong, 1I
 Wang, Mingjun, 3E
 Wang, Ning, 1G
 Wang, P., 0V
 Wang, Peisi, 3G
 Wang, Qi-chao, 3I
 Wang, Qingquan, 1Z
 Wang, Ran, 1G, 3G
 Wang, Shanshan, 1E
 Wang, Shunyan, 3B
 Wang, Tao, 1Q
 Wang, Xingshu, 0B
 Wang, Xinqiu, 33
 Wang, Xuemin, 1X
 Wang, Y., 0V
 Wang, Ya-fu, 2L
 Wang, Yibo, 02
 Wang, Yongtian, 1E
 Wang, You, 3B

Wang, Yu, 20	Yan, Xiugang, 0R
Wang, Zhe, 3L, 3V	Yan, Yang, 3K
Wang, Zhenye, 0H	Yan, Yining, 0U
Wei, Gongxiang, 0J	Yang, Deshan, 27
Wei, Haoyun, 1C	Yang, Hang, 01
Wei, Peng, 2I	Yang, Hui, 02, 09
Wei, Wei, 2O, 3W	Yang, Jian-lu, 2K, 2O
Wei, Wenjian, 32	Yang, Jin-bao, 0Z
Wen, Hongqiao, 0O	Yang, Juntang, 35
Wen, Qiao, 2E	Yang, Lijie, 1X
Wen, Shuai, 0M	Yang, Peng, 0G
Wen, Tao, 2E	Yang, Shu-wei, 1O
Weng, Chun-sheng, 2K, 2O, 2W	Yang, Tan, 2B
Wu, Dong-sheng, 0X	Yang, Wei, 1Y
Wu, Guanghua, 0R	Yang, Xiaoyu, 3H
Wu, Hong, 0W	Yang, Xinpan, 0E
Wu, Qipeng, 08	Yang, Yangyang, 32
Wu, Shengli, 1Q	Yang, Yi, 1N
Wu, Tengfei, 1H, 1T	Yang, Zhi hui, 05
Wu, Yan, 09	Yao, Dapeng, 0M
Wu, Ye, 04	Yao, Li-bin, 2T
Wu, Yirong, 1G, 3G	Ye, Jiesong, 09
Wu, Yun-long, 2G, 2L	Ye, Manping, 3N
Xi, Xiaoqi, 3D	Ye, Qiong, 2V
Xia, Ji, 32	Yi, Shihe, 16, 1V
Xia, Junwen, 18	Yin, Dejin, 0P, 17, 18
Xia, Ming, 0P, 17, 18, 2F	Ying, Jia-ju, 0X
Xiao, Hong, 1B	You, Ku, 2R
Xiao, Tiqiao, 0J	Yu, Dakuan, 0F
Xiao, Xue, 09	Yu, Fei, 3K
Xie, Xinhua, 26	Yu, Lei, 1K, 1P, 2C
Xin, Jia, 36	Yu, Xilong, 31
Xin, Ming-yuan, 10	Yu, Yanzhong, 06
Xiong, Hanwei, 3T	Yu, Yingjie, 1Z
Xiong, Hao, 0B	Yu, Yu-xiang, 2C
Xiong, J. J., 2H	Yu, Zhaoxiang, 29
Xiong, Shuidong, 1L, 32	Yuan, Quan, 1N
Xiong, Zhao, 1X	Yuan, Xueguang, 24
Xu, Chenxi, 3T	Yue, Guo, 36
Xu, Dian, 2C	Yue, Kang, 0E
Xu, Jun, 3T	Zeng, Hao, 0Y
Xu, Min, 15, 1B, 3Y	Zeng, Hui, 31
Xu, Nan, 13	Zeng, Lijiang, 3Q
Xu, Peng, 0N	Zhai, Wen-chao, 3A, 3W
Xu, Shan, 0I	Zhai, Zhongsheng, 2A
Xu, Shike, 2D	Zhan, Cheng, 1E
Xu, Shilong, 1K	Zhang, Bao-zhou, 2U
Xu, Weidong, 35	Zhang, Bin, 1S, 28
Xu, Wenhai, 27	Zhang, Chen, 39
Xu, Xiaoyi, 20	Zhang, Cheng, 0I
Xu, Xueyang, 3Y	Zhang, Dong, 18
Xu, Yameng, 1U	Zhang, Dongyang, 26
Xu, Yuan-nan, 0Z	Zhang, Hanming, 3D
Xue, Liangping, 3B	Zhang, Jicun, 2T
Xue, Shuai, 0A	Zhang, Ji-kui, 3I
Xue, Zi, 23, 2M	Zhang, Jiyan, 1D
Xun, Li-na, 3W	Zhang, Juan, 38
Yan, Bin, 3D, 3S	Zhang, Keshu, 1G, 3G
Yan, Huimin, 1W, 20, 30	Zhang, Lin, 1N, 21
Yan, Jing, 1M, 1R	Zhang, Meng, 3A

Zhang, P., 2P	Zhou, Tian, 1C
Zhang, Qingchuan, 03	Zhou, Weihua, 0R
Zhang, Quan, 1R, 3W	Zhu, Feng, 3C
Zhang, Quan-bing, 14	Zhu, Jing, 0B
Zhang, Rong, 1U	Zhu, Qi, 1F
Zhang, Shaohua, 31	Zhu, Qi-Hai, 0N
Zhang, Shuqin, 0R	Zhu, R., 0V
Zhang, Tao, 0U, 1X	Zhu, Xiang, 0G
Zhang, Tao, 12	Zhu, Xiuqing, 0E
Zhang, Tianshu, 0C	Zhu, Zhendong, 3R
Zhang, Tongyi, 2X	Zong, Junjun, 09
Zhang, W., 0V	Zou, Mei, 2T
Zhang, Wang, 27	
Zhang, Wei, 3B	
Zhang, Weiwei, 3F	
Zhang, Wen, 02	
Zhang, Wenjie, 1L	
Zhang, Wenjing, 0G	
Zhang, Wen-tao, 2B	
Zhang, Wenwen, 2Q	
Zhang, Xiangchao, 1B, 3Y	
Zhang, Xiangqian, 26	
Zhang, Xiaolei, 1B	
Zhang, Xiao-ying, 2U	
Zhang, Xiuda, 1W, 30	
Zhang, Xueao, 01	
Zhang, Yangan, 24	
Zhang, Yan-na, 1M, 3W	
Zhang, Yan-song, 0Z	
Zhang, Yujun, 2R	
Zhang, Zhigang, 3M	
Zhang, Zhijian, 25	
Zhang, Zhipeng, 2Z	
Zhang, Zhiwei, 0G	
Zhao, Chang-Ming, 0N	
Zhao, Chunbo, 1H, 1T	
Zhao, Da-peng, 3I	
Zhao, Junfa, 0I	
Zhao, Nan-xiang, 1P	
Zhao, Rong, 2N	
Zhao, Wei-qiang, 2U	
Zhao, Xing, 38	
Zhao, Xuesong, 09	
Zhao, Ye, 3V	
Zhao, Yuan-Yuan, 3O	
Zhao, Zhen-Sheng, 3O	
Zheng, Fanglan, 21, 3H	
Zheng, Leilei, 2I	
Zheng, Mei-Ling, 3O	
Zheng, Xiao-bing, 1M, 1R, 3A, 3W	
Zhong, Shengyou, 2T	
Zhou, Ben-mou, 3U	
Zhou, Ciming, 0L	
Zhou, Hengyan, 3Q	
Zhou, Jiankang, 1A	
Zhou, Jie, 3B	
Zhou, Ketao, 2S	
Zhou, L. W., 2P	
Zhou, Liqiu, 38	
Zhou, Sheng, 2J	

Conference Committees

Conference Chairs

Sen Han, University of Shanghai for Science and Technology (China)

Virendra N. Mahajan, University of Arizona (United States)

Jiubin Tan, Harbin Institute of Technology (China)

Organizing Committee

Qing Ran, National Institute of Measurement and Testing Technology
(China)

Zuobin Wang, Changchun University of Science and Technology
(China)

Yongjun Xie, Xi'an Institute of Optics and Fine Mechanics (China)

Program Committee

Yingjie Yu, Shanghai University (China)

Jianqiang Zhu, Shanghai Institute of Optics and Fine Mechanics
(China)

Introduction

We had the great honor of organizing the International Symposium on Optical Measurement Technology and Instrumentation. It was truly a great pleasure for us to greet the more than 1000 participants from many different countries who attended the symposium. We firmly believe the symposium will become an important international event in the field of optical technology.

The International Symposium on Optical Measurement Technology and Instrumentation was sponsored by the Chinese Society for Optical Engineering and China High-tech Industrialization Association (CHIA), organized by Chinese Society for Optical Engineering (CSOE), Photo-electronic Technology Committee, Chinese Society of Astronautics, Photo-electronic Industrialization Committee, CHIA, and Department of Cooperation and Coordination for Industry, Academe, and Research, CHIA.

The purpose of the symposium is to provide a forum for the participants to report and review the innovative ideas and up-to-date progress and developments, and discuss the novel approaches to application in the optical field. It is sincerely hoped that the research and development in optical field will be promoted, and the international cooperation sharing the common interest will be enhanced.

On behalf of other co-chairmen, and the Organization Committee, we would like to heartily thank our sponsors and cooperating organizers for all they have done for the symposium. Thanks also to all the authors for their contributions to the proceedings, to all of the participants and friends for their interest and efforts in helping us to make the symposium possible, to the Program Committee for their effective work and valuable advice, especially the Secretariat, and to the SPIE staff for their tireless efforts and outstanding service in preparing and publishing the proceedings.

Sen Han
Jiubin Tan