

PROCEEDINGS OF SPIE

*International Symposium on Photoelectronic
Detection and Imaging 2011*

Advances in Infrared Imaging and Applications

Jeffery J. Puschell
Junhao Chu
Haimei Gong
Jin Lu
Editors

Organized by
Photoelectronic Technology Professional Committee, CSA (China)
Tianjin Jinhang Institute of Technical Physics, CASIC (China)
Science and Technology on Low Light Level Night Vision Laboratory (China)

Sponsored by
Chinese Society of Astronautics (China)

Volume 8193

Proceedings of SPIE, 0277-786X, v. 8193

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

International Symposium on Photoelectronic Detection and Imaging 2011: Advances in Infrared Imaging and Applications, Jeffery J. Puschell, Junhao Chu, Haimei Gong, Jin Lu, Eds., Proc. of SPIE Vol. 8193, 819301 · © 2011 SPIE · CCC code: 0277-786X/11/\$18 · doi: 10.1117/12.905100

Proc. of SPIE Vol. 8193 819301-1

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 *International Symposium on Photoelectronic Detection and Imaging 2011: Advances in Infrared Imaging and Applications*, edited by Jeffery J. Puschell, Junhao Chu, Haimei Gong, Jin Lu, Proceedings of SPIE Vol. 8193 (SPIE, Bellingham, WA, 2011) Article CID Number.

ISSN 0277-786X
ISBN 9780819488343

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 © 2011, 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/11/\$18.00.

Printed in the United States of America.

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

The logo for SPIE Digital Library features the word "SPIE" in a bold, sans-serif font above the words "Digital Library" in a smaller, sans-serif font. To the right of the text is a stylized graphic consisting of three vertical bars of increasing height from left to right, with a curved line above them.

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

Part One

xix	<i>Symposium Committee</i>
xxi	<i>Conference Committee</i>
xxiii	<i>Introduction</i>
xxv	<i>Cooperating Organizations</i>

ADVANCES IN INFRARED IMAGING AND APPLICATIONS

- 8193 02 **A method for real-time implementation of HOG feature extraction (Invited Paper)** [8193-01]
H. Luo, Shenyang Institute of Automation (China), Key Lab. of Optical-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China); X. Yu, Shenyang Institute of Automation (China), Graduate Univ. of the Chinese Academy of Sciences (China), Key Lab. of Optical-Electronics Information Processing (China), Key Lab. of Image Understanding and Computer Vision (China), and AVIC Hongdu Aviation Industry Group Ltd. (China); H. Liu, AVIC Hongdu Aviation Industry Group Ltd. (China); Q. Ding, Republic of China Air Force (China)
- 8193 03 **Study on the temporal and spatial characteristics of high-speed turbulent flow field and its optical transmission effects (Invited Paper)** [8193-02]
C. Chen, Beijing Electronic System Engineering Institute (China); J. Fei, Beijing Simulation Ctr. (China); S. Yi, National Univ. of Defense Technology (China); W. Tang, Beijing Electronic System Engineering Institute (China)
- 8193 04 **Shearlet-based hard-thresholding for interfered infrared image denoising** [8193-03]
R. Zou, C. Shi, E. Mao, Beijing Institute of Technology (China)
- 8193 05 **An improved triangle star pattern recognition algorithm with high identification probability** [8193-04]
L. Du, Y. Zhao, Beihang Univ. (China)
- 8193 06 **Anomaly detection using background prediction in hyperspectral images** [8193-05]
D. Liu, G. He, J. Zhang, Xidian Univ. (China)
- 8193 07 **Design, fabrication, and characterization of quantum well infrared photoconductor in long-wavelength infrared** [8193-06]
J. Jin, J. Chen, C. Lin, Shanghai Institute of Technical Physics (China)
- 8193 08 **Simulation of realistic infrared texture of aeolian sand ripples** [8193-07]
Q. Liu, Shenyang Institute of Automation (China), Graduate Univ. of the Chinese Academy of Sciences (China), Key Lab. of Opto-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China); F. Zhu, Shenyang Institute of Automation (China), Key Lab. of Opto-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China); X. Long, Office of Air Force (China); Y. Hao, S. Fu, Shenyang Institute of Automation (China), Key Lab. of Opto-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China)

- 8193 09 **A field transition particle filter tracking algorithm** [8193-08]
D. Xu, Graduate Univ. of the Chinese Academy of Sciences (China), Shenyang Institute of Automation (China), Key Lab. of Optical-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China); Z. Shi, Shenyang Institute of Automation (China), Key Lab. of Optical-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China); X. Yu, AVIC Hongdu Aviation Industry Group Ltd. (China); Q. Ding, Equipment Academy of Air Force (China); H. Luo, Shenyang Institute of Automation (China), Key Lab. of Optical-Electronics Information Processing (China), and Key Lab. of Image Understanding and Computer Vision (China)
- 8193 0A **The design research of a spinel dome** [8193-09]
H. Zhao, T. Hou, B. Zhu, Q. Huang, Z. Gao, Southwest Institute of Technical Physics (China)
- 8193 0B **The ship-borne infrared searching and tracking system based on the inertial platform** [8193-10]
Y. Li, H. Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8193 0C **The research of the coupling of circuit and chip** [8193-11]
Y. Wang, H. Yuan, Q. Xu, Shanghai Institute of Technical Physics (China)
- 8193 0D **Two-step local Wiener filter using dual-tree complex wavelet transform** [8193-12]
X. Zhang, Xianyang Normal Univ. (China) and Xidian Univ. (China); X. Feng, Xidian Univ. (China)
- 8193 0E **A new recurrent wavelet neural networks for adaptive equalization** [8193-13]
Y. Sun, Y. Chen, X. Luo, X. Lin, J. Lu, Tianjin Jinhang Institute of Technology Physics (China)
- 8193 0F **Study on image jamming effect of infrared imaging system induced by CO₂ laser** [8193-14]
J. Che, D. Wang, H. Zhang, L. Zhang, L. Zhang, Z. Dong, People's Liberation Army (China)
- 8193 0G **Performance degradation of space Stirling cryocoolers due to gas contamination** [8193-15]
X. Liu, Hangzhou Dianzi Univ. (China); Y. Wu, Shanghai Institute of Technical Physics (China); S. Yang, X. Zhang, Ministry of Information Industry (China); G. Lu, Shanghai Institute of Technical Physics (China); L. Zhang, Hangzhou Dianzi Univ. (China)
- 8193 0H **Fabrication and low temperature characteristics of InGaAs detector** [8193-16]
Y. Lv, Luoyang Opto-electro Technology Development Ctr. (China); Q. Meng, Henan Univ. of Science and Technology (China)
- 8193 0I **Research on method of infrared spectral imaging based on thermal imager** [8193-17]
K. Huan, X. Shi, W. Wu, F. Zheng, X. Liu, Changchun Univ. of Science and Technology (China)
- 8193 0J **Performance analysis of quantum dots infrared photodetector** [8193-18]
H. Liu, Xidian Univ. (China) and Shanxi Datong Univ. (China); F. Zhang, Xi'an Univ. of Technology (China); J. Zhang, G. He, Xidian Univ. (China)
- 8193 0K **Design of reimaging F/1.0 long-wavelength infrared optical system** [8193-19]
X. Zhang, B. Liu, H. Jia, Changchun Institute of Optics, Fine Mechanics and Physics (China)

- 8193 0L **Numerical analysis and experimental research on active infrared thermographic NDT in composite materials** [8193-20]
C. Wu, SICON OPTO-Electonic Ltd. (China), Northwestern Polytechnical Univ. (China), and Xi'an Research Institute of Hi-Tech (China); W. Wang, Q. Yuan, SICON OPTO-Electonic Ltd. (China); Y. Li, Northwestern Polytechnical Univ. (China); W. Zhang, Xi'an Research Institute of Hi-Tech (China); X. Zhang, No. 203 Research Institute of China Ordnance Industries (China)
- 8193 0M **Research on multi-angle near infrared spectral-polarimetric characteristic for polluted water by spilled oil** [8193-21]
H. Shen, Anhui Univ. of Architecture (China); P. Zhou, Hefei New Star Applied Technology Research Institute (China); S. Feng, Anhui Univ. of Architecture (China)
- 8193 0N **Research on quantitative relationship between NIIRS and the probabilities of discrimination** [8193-22]
H. Bai, Engineering College of Armed Police Force (China)
- 8193 0O **The electrical characteristics of the HgInTe crystal and Pt/HgInTe Schottky contacts** [8193-23]
X. L. Zhang, W. G. Sun, L. Zhang, Z. X. Lu, Luoyang Optoelectronic Institute (China)
- 8193 0P **A cryogenic temperature eight-cell CMOS differential current amplifier for IR detectors** [8193-24]
H. Yuan, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); Y. Chen, S. Chen, Q. Liu, X. Xu, Shanghai Institute of Technical Physics (China)
- 8193 0Q **Analysis on quantitative relationship between design parameters of infrared remote sensor and NIIRS** [8193-25]
Y. Jin, Northwest Univ. (China) and Engineering College of Armed Police Force (China); H. Bai, Engineering College of Armed Police Force (China)
- 8193 0R **Moving object detection based on segmentation of optical flow field in IR image sequence** [8193-26]
H. Lu, T. Zhang, Huazhong Univ. of Science and Technology (China)
- 8193 0S **Noise research of microbolometer array under temperature environment** [8193-27]
Y. Gao, Nanyang Institute of Technology (China) and Nanjing Univ. of Science and Technology (China); H. Chen, Nanyang Institute of Technology (China); Y. Xu, Nanyang Institute of Technology (China) and Nanjing Univ. of Science and Technology (China); X. Sun, B. Chang, Nanjing Univ. of Science and Technology (China)
- 8193 0T **Optimal design of UAV's pod shape** [8193-28]
Q. Wei, H. Jia, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8193 0U **A theoretical structure calculation of MWIR HgCdTe e-APD** [8193-29]
R. Gu, C. Shen, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); L. Chen, Shanghai Institute of Technical Physics (China)

- 8193 0V **Evaluation of the operating range for ground-based infrared imaging tracking system** [8193-30]
B. Zhang, Z. Zhang, S. Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8193 0W **The algorithm of small and weak linear target detection** [8193-31]
Z. Han, H. Zheng, Y. Zhao, L. Guo, Air Defense Forces Command Academy (China)
- 8193 0X **Infrared camera based on optical-readout bi-material FPA** [8193-32]
Y. Kong, R. Liu, B. Jiao, D. Chen, Institute of Microelectronics (China) and Kunshan MicroOptica Electronic Co. Ltd. (China)
- 8193 0Y **The effect of flash power on the measurement of thermal effusivity using thermal wave imaging** [8193-33]
Z. Zeng, Chongqing Normal Univ. (China) and Capital Normal Univ. (China); N. Tao, L. Feng, Y. Li, C. Zhang, Capital Normal Univ. (China)
- 8193 0Z **High-throughput median filter for high-performance infrared imaging system** [8193-34]
X. Qin, Y. Ma, H. Li, J. Bo, Huazhong Univ. of Science and Technology (China)
- 8193 10 **Discriminative region extraction and feature selection based on the combination of SURF and saliency** [8193-35]
L. Deng, Institute of Optics and Electronics (China), Key Lab. of Adaptive Optics (China), and Graduate Univ. of the Chinese Academy of Sciences (China); C. Wang, C. Rao, Institute of Optics and Electronics (China) and Key Lab. of Adaptive Optics (China)
- 8193 11 **Dislocation cell structures in CdZnTe substrates and its behavior of threading into HgCdTe LPE epilayers** [8193-36]
X. Cui, W. Fang, Y. Wei, C. Zhang, H. Xu, S. Sun, J. Yang, Shanghai Institute of Technical Physics (China)
- 8193 12 **Comparison of two types of optical systems for space-borne staring IR sensors** [8193-37]
Y. Li, G. Zheng, Beijing Institute of Space Mechanics and Electricity (China)
- 8193 13 **Design of infrared imaging system for inner-formation flying system** [8193-38]
D. Han, L. Xiao, National Univ. of Defense Technology (China); Z. Wang, Tsinghua Univ. (China); K. Liu, National Univ. of Defense Technology (China)
- 8193 14 **Water spray parameters study with the minimum infrared transmission in the atmospheric windows** [8193-39]
Z. Chen, C. Li, L. Zhang, L. Zhang, Naval Academy of Armament (China); H. Chen, Attached Middle School of Hebei Normal College for Nationalities (China)
- 8193 15 **Defects detection in crystalline silicon solar cells based on electroluminescence imaging** [8193-40]
X. Jiang, C. Wang, X. Wang, Y. Zong, C. Pei, Academy of Armored Force Engineering (China)

- 8193 16 **A new design of ROIC with CDS and programmable arbitrary line selection** [8193-41]
P. Wang, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); R. Ding, Shanghai Institute of Technical Physics (China); G. Chen, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); H. Chen, Shanghai Institute of Technical Physics (China); L. Hao, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China)
- 8193 17 **A high performance readout circuit (ROIC) with BDI structure for SWIR FPAs** [8193-42]
L. Hao, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); R. Ding, A. Huang, H. Chen, C. Zhou, Shanghai Institute of Technical Physics (China); P. Wang, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China)
- 8193 18 **An efficient method for infrared small target detection** [8193-43]
Z. Su, D. Zhao, J. Qi, Beihang Univ. (China)
- 8193 19 **The application of pulsed thermography in the inspection of wind turbine blades** [8193-44]
N. Tao, Capital Normal Univ. (China); Z. Zeng, Capital Normal Univ. (China) and Chongqing Normal Univ. (China); L. Feng, Capital Normal Univ. (China); X. Li, Beijing Waiteksin Advanced Technology Co., Ltd. (China); Y. Li, Sinomatech Wind Power Blades Co., Ltd. (China); C. Zhang, Capital Normal Univ. (China)
- 8193 1A **Mechanism and implementation of bidirectional IR scene simulation system based on the Peltier effect** [8193-45]
Y. Feng, Y. Lu, J. Shen, Electronic Engineering Institute (China)
- 8193 1B **The LQG/LTR controller design for miniaturized infrared stabilizing platform** [8193-46]
R. Xiao, Kunming Univ. of Science and Technology (China); T. Li, Kunming Univ. of Science and Technology (China) and Kunming Shipbuilding Equipment Co., Ltd. (China); P. Zhang, Kunming Institute of Physics (China); X. Jia, Kunming Univ. of Science and Technology (China); Y. Qin, C. Xian, Kunming Univ. of Science and Technology (China) and Kunming Shipbuilding Equipment Co., Ltd. (China)
- 8193 1C **IR line scanner on UAV** [8193-47]
S. Liu, J. Qin, H. Qi, G. Xiao, Shanghai Institute of Technical Physics (China)
- 8193 1D **The detection of chlorophyll content for salt stress of the wheat seedling by hyperspectral imaging** [8193-48]
Q. Wu, Jilin Univ. (China) and Beijing Research Ctr. for Information Technology in Agriculture (China); D. Zhu, C. Wang, Z. Ma, D. Zhang, Beijing Research Ctr. for Information Technology in Agriculture (China); K. Chen, Jilin Univ. (China); J. Wang, Jilin Univ. (China) and Beijing Research Ctr. for Information Technology in Agriculture (China)
- 8193 1E **Removing impulsive noise for infrared image with difference images and adaptive filter** [8193-49]
J. Zhao, H. Feng, Z. Xu, Q. Li, Zhejiang Univ. (China)

- 8193 1F **As₂/Ga flux ratios and low-temperature annealing dependence of Ga_{1-x}Mn_xAs films by x-ray absorption spectroscopy** [8193-50]
X. C. Cao, G. S. Yao, L. X. Zhang, L. W. Wang, Y. Q. Lv, Z. Y. Peng, Luoyang Optoelectronic Institute (China)
- 8193 1G **Thermal imaging experiments of motor vehicles under low visibility at night** [8193-51]
X. Wang, Institute of Chemical Defense (China)
- 8193 1H **Analysis to stray radiation of infrared detecting system** [8193-52]
J. Niu, North China Univ. of Water Conservancy and Electric Power (China) and Xi'an Institute of Optics and Precision Mechanics (China); S. Shi, North China Univ. of Water Conservancy and Electric Power (China); R. Zhou, Xi'an Institute of Optics and Precision Mechanics (China)
- 8193 1I **An FPGA-based heterogeneous image fusion system design method** [8193-53]
L. Song, Y. Lin, Y. Chen, M. Zhao, Tianjin Univ. (China)
- 8193 1J **Dim moving target detection method based on time-frequency analysis** [8193-54]
Z. Li, L. Tian, W. Zheng, Y. Zhang, Chongqing Univ. (China); G. Jin, China Aerodynamics Research and Development Ctr. (China) and Institute of Optics and Electronics (China)
- 8193 1K **Correlation recognition device based on spatial light modulator for infrared imaging system** [8193-55]
Y. Wang, Communication Univ. of China (China)
- 8193 1L **IR image synthesis for small target under sky background** [8193-56]
Q. Cao, Y. Shen, J. An, People's Liberation Army (China)
- 8193 1M **Improved particle filtering algorithm based on the multi-feature fusion for small IR target tracking** [8193-57]
E. Ji, G. Gu, W. Qian, L. Bai, X. Sui, Nanjing Univ. of Science and Technology (China)
- 8193 1N **The research and implementation of CFAR in infrared small target detection** [8193-58]
F. Xu, G. Gu, W. Qian, Nanjing Univ. of Science and Technology (China)
- 8193 1O **Noninvasive blood glucose sensing on human body with near-infrared reflection spectroscopy** [8193-59]
Z. Huang, C. Hao, L. Zhang, Y. Huang, Y. Shi, G. Jiang, J. Duan, Shanghai Jiaotong Univ. (China)
- 8193 1P **A new registration method of infrared and visible images based on improved edge extraction and revised measure function** [8193-60]
J. Han, T. Huang, Y. Zhang, L. Bai, Nanjing Univ. of Science and Technology (China)
- 8193 1Q **Design of antireflection film for underwater laser imaging system** [8193-61]
X. Zhang, Heilongjiang Institute of Science and Technology (China) and Harbin Engineering Univ. (China); J. Sun, Harbin Engineering Univ. (China)

- 8193 1R **Design of high ratio middle infrared continuous zoom optical system** [8193-62]
Z. Fan, Xi'an Institute of Optics and Precision Mechanics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); J. Cao, Xi'an Institute of Optics and Precision Mechanics (China); H. Yang, Xi'an Institute of Optics and Precision Mechanics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); E. Qu, D. Wu, Xi'an Institute of Optics and Precision Mechanics (China)
- 8193 1S **Analysis and research on the thermal stress of detector affected by packaging accuracy** [8193-63]
L. Fu, WiO Technology Co., Ltd. (China)
- 8193 1T **The technology of generating infrared image based on electric heating film technology** [8193-64]
Y. Lu, Y. Feng, Y. Qiao, State Key Lab. of Pulsed Power Laser Technology (China)
- 8193 1U **Design of catadioptric middle infrared continuous zoom lens for uncooled infrared detector** [8193-65]
K. Jiang, S. Zhou, J. Duan, Y. Wang, H. Zhang, Xi'an Institute of Optics and Precision Mechanics (China)
- 8193 1V **A millimeter wave image fusion algorithm design and optimization based on CDF97 wavelet transform** [8193-66]
J. Yu, Hangzhou Dianzi Univ. (China); B. Chen, China Meteorological Administration (China); A. Xia, X. Liu, Hangzhou Dianzi Univ. (China)
- 8193 1W **Jamming efficiency evaluation of the IR smoke screen against high-orbit IR detector** [8193-67]
G. Gao, Y. Li, Xi'an Research Institute of High Technology (China)
- 8193 1X **Strain-compensated InP-based InGaAsInAlAs quantum cascade infrared detectors for a 3~5 μ m atmospheric window** [8193-68]
S. Zhai, J. Liu, N. Kong, F. Liu, L. Li, L. Wang, Z. Wang, Institute of Semiconductors (China)
- 8193 1Y **The background suppression algorithm based on the two-dimensional velocity vector histogram and the estimated risk** [8193-69]
J. Qin, Q. Chen, W. Qian, Nanjing Univ. of Science and Technology (China)
- 8193 1Z **BP network identification technology of infrared polarization based on fuzzy c-means clustering** [8193-70]
H. Zeng, G. Gu, W. He, Q. Chen, W. Yang, Nanjing Univ. of Science and Technology (China)
- 8193 20 **Investigation on the optical properties of sulfur-doped diamond thin films** [8193-71]
Y. Wang, North China Electric Power Univ. (China); Q. Zhao, Hebei Univ. (China); Z. Yin, Z. Zhao, North China Electric Power Univ. (China)
- 8193 21 **Detection of IR target by fusing multispectral IR data** [8193-72]
L. Li, M. Qi, X. Gao, North China Research Institute of Electro-optics (China)
- 8193 22 **Study on reliability enhancement testing for InSb focal plane array detector** [8193-73]
M. Chao, P. Jing, M. Wei, Luoyang Optoelectronic Institute (China)

- 8193 23 **The accelerated vacuum life test research of Dewar** [8193-74]
Y. Zhang, X. Wang, S. Zhu, H. Gong, Shanghai Institute of Technical Physics (China)
- 8193 24 **A wavelet-based adaptive fusion algorithm of infrared polarization imaging** [8193-75]
W. Yang, G. Gu, Q. Chen, H. Zeng, Nanjing Univ. of Science and Technology (China)
- 8193 25 **Research on portable intelligent monitoring system based on video server** [8193-76]
G. Song, Y. Na, F. Yang, S. Cao, Changchun Univ. of Science and Technology (China)
- 8193 26 **Enhancement algorithm for real-time infrared image processing** [8193-77]
T. Si, L. Wang, Ningbo Dahongying Univ. (China); Y. Tian, Guizhou Univ. (China); J. Zhang, Nanjing Univ. of Science and Technology (China)
- 8193 27 **Analyzing the CO₂ column amount in China with GOSAT data** [8193-78]
C. Gong, Y. Zhou, Y. Hu, Shanghai Institute of Technical Physics (China)
- 8193 28 **Research on bad pixel variation of IRFPA by high temperature storage and temperature shock** [8193-79]
W. Wang, Northwestern Polytechnical Univ. (China) and Luoyang Opto-electro Technology Development Ctr. (China); Y. Fan, Northwestern Polytechnical Univ. (China); Y. Fu, J. Wang, W. Wu, J. Wang, Q. Guo, J. Liu, Luoyang Opto-electro Technology Development Ctr. (China)
- 8193 29 **The research of real-time image stabilization in the focal plane based on motion detection** [8193-80]
W. Zhou, C. Tan, L. Ding, H. Pei, Shanghai Institute of Technical Physics (China)
- 8193 2A **Performance evaluation of imaging seeker tracking algorithm based on multi-features** [8193-81]
Y. Li, J. Yan, Beijing Institute of Technology (China) and China North Industries Group (China)
- 8193 2B **X-ray diffraction analysis of high quality InAs/GaSb Type II superlattices grown by MBE** [8193-82]
Y. Zhou, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); J. Chen, Q. Xu, L. He, Shanghai Institute of Technical Physics (China)
- 8193 2C **Response characteristic of InSb IRFPA under high reverse bias condition** [8193-83]
J. Liu, Q. Guo, W. Wang, Z. Peng, Luoyang Opto-electro Technology Development Ctr. (China)
- 8193 2D **Application of multiple projector technologies for HWIL simulations** [8193-84]
H. Yu, J. Fei, Z. Yang, H. Du, Y. Gao, Y. Zhang, Beijing Simulation Ctr. (China)
- 8193 2E **The evaluation of curved extended electrodes for off-area bonding of HgCdTe photoconductive detectors** [8193-85]
D. Qian, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); J. Jia, Y. Tang, Shanghai Institute of Technical Physics (China); F. Liu, X. Ma, L. Zhang, F. Liu, B. Ye, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); H. Qiao, L. Zhu, X. Li, Shanghai Institute of Technical Physics (China)

- 8193 2F **The study of a linear optimal location the typhoon center automatic from IR satellite cloud image** [8193-86]
Y. Li, Southeast Univ. (China) and PLA Univ. of Science and Technology (China); X. Chen, PLA Univ. of Science and Technology (China); S. Fei, Southeast Univ. (China); K.-F. Mao, K. Zhou, PLA Univ. of Science and Technology (China)
- 8193 2G **A real-time gray projection algorithm for electronic image stabilization** [8193-87]
W. Yang, Z. Zhang, Y. Zhang, X. Lu, J. Li, Z. Shi, National Univ. of Defense Technology (China)

Part Two

- 8193 2H **Design of a low noise and high accuracy readout integrated circuit for infrared detectors** [8193-88]
D. Yang, H. Zhou, J. Wang, Tianjin Jinhang Institute of Technology Physics (China)
- 8193 2I **The new approach for infrared target tracking based on the particle filter algorithm** [8193-89]
H. Sun, Changchun Institute of Optics, Fine Mechanics and Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); H. Han, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8193 2J **Research on infrared dim-point target detection and tracking under sea-sky-line complex background** [8193-90]
Y. Dong, Y. Li, H. Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8193 2K **Study of SF₆ gas decomposition products based on spectroscopy technology** [8193-91]
J. Cai, Y. Na, W. Ni, G. Li, K. Feng, G. Song, Changchun Univ. of Science and Technology (China)
- 8193 2L **High quality mid-infrared InAs film grown on (100) GaSb substrate by LPE using a ternary melt** [8193-92]
C. Sun, S. Hu, Q. Wang, J. Wu, N. Dai, Shanghai Institute of Technical Physics (China)
- 8193 2M **Research on an Al\SiN_x bi-material thermal-mechanical uncooled infrared FPA pixel** [8193-93]
X. Zhang, Communication Univ. of China (China); D. Zhang, Peking Univ. (China)
- 8193 2N **Based on momentum method BP neural network in the target recognition research and application** [8193-94]
X. Zhang, North Univ. of China (China); Y. Gao, National Key Lab. for Electronic Measurement Technology (China)
- 8193 2O **Research on I-V temperature characteristic for InSb IRFPA** [8193-95]
Q. Guo, J. Liu, W. Wang, J. Si, J. Wang, Luoyang Opto-electro Technology Development Ctr. (China)
- 8193 2P **Effects of thermal annealing on HgCdTe/CdTe/Si(211) by MBE** [8193-96]
C. Shen, R. Gu, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); X. Fu, W. Wang, Y. Guo, L. Chen, G. Wang, F. Yang, L. He, Shanghai Institute of Technical Physics (China)

- 8193 2Q **The sequence measurement system of the IR camera** [8193-97]
A. Geng, H. Han, H. Zhang, Changchun Institute of Optics, Fine Mechanics and Physics (China)
- 8193 2R **Improved sum-of-squared-differences tracking algorithm for thermal vision systems** [8193-98]
G. Bieszczad, T. Sosnowski, H. Madura, Military Univ. of Technology (Poland)
- 8193 2S **Preparation and characteristics of PLZT (8/65/35) thin films by sol-gel method** [8193-99]
X. Sun, W. Liu, S. Zhou, J. Luo, Xi'an Technological Univ. (China)
- 8193 2T **Compact middle infrared zoom lens design** [8193-100]
X. Zhang, M. Jiao, Y. Luan, W. Chang, T. Sun, Xi'an Institute of Applied Optics (China)
- 8193 2U **Accuracy assessment for infrared camera laboratory radiometric calibration** [8193-101]
X. Xie, Harbin Institute of Technology (China) and Heilongjiang Institute of Science and Technology (China); W. Zhang, H. Nie, Y. Cao, Q. Wang, H. Wang, Harbin Institute of Technology (China)
- 8193 2V **A new FOD recognition algorithm based on multi-source information fusion and experiment analysis** [8193-102]
Y. Li, G. Xiao, Shanghai Jiaotong Univ. (China)
- 8193 2W **Ground experiment of infrared characteristics of space target** [8193-103]
W. Ke, G. Cai, D. Zhu, W. Shen, Beihang Univ. (China); J. Liu, W. Wang, L. Yuan, National Key Lab. of Science and Technology (China)
- 8193 2X **Photoelectron characteristics of HgInTe detector** [8193-104]
L. Zhang, X. L. Zhang, W. G. Sun, Z. X. Lu, Luoyang Optoelectronic Technology Development Ctr. (China)
- 8193 2Y **The underwater camera calibration based on virtual camera lens distortion** [8193-105]
D. Qin, T. Mao, Southwest Petroleum Univ. (China); P. Cheng, Z. Zhang, The Chinese People's Liberation Army (China)
- 8193 2Z **Anomalous hall effect in arsenic-doped HgCdTe grown by Te-rich LPE** [8193-106]
G.-Y. Qiu, C.-J. Zhang, Y.-F. Wei, X.-J. Chen, Q.-Q. Xu, J.-R. Yang, Shanghai Institute of Technical Physics (China)
- 8193 30 **Distribution of thermal discharge from a power station based on HJ-1B and FY-3 thermal infrared data** [8193-107]
Y. Zhou, C. Gong, Y. Hu, Q. Chen, Shanghai Institute of Technical Physics (China)
- 8193 31 **Research of spectral curvature correction method for hyperspectral images** [8193-108]
L. Li, Y. Hu, Y. Wang, Shanghai Institute of Technical Physics (China)
- 8193 32 **The research of piezoelectric actuator for cryogenic scanning application** [8193-109]
X. Zhang, G. Zhao, M. Pan, Shanghai Institute of Technical Physics (China)

- 8193 33 **Measurement of defect depth by peak second derivative method in pulse thermography** [8193-110]
L. Feng, R. He, Y. Zhang, Capital Normal Univ. (China)
- 8193 34 **Risk analysis on fabrication process of IRFPA** [8193-111]
H. Wang, Northwestern Polytechnical Univ. (China) and Luoyang Opto-electro Technology Development Ctr. (China); X. Qin, Northwestern Polytechnical Univ. (China)
- 8193 35 **Study of the characteristics of VLWIR HgCdTe photovoltaic detectors in variable-area diode test structures** [8193-112]
X. Xie, H. Hua, G. Qiu, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); Q. Liao, X. Hu, Shanghai Institute of Technical Physics (China)
- 8193 36 **A detecting algorithm of infrared armor target under complex ground background based on morphological wavelet** [8193-113]
C.-L. Wang, Z.-B. Chen, M.-X. Xue, B.-H. Liu, Ordnance Engineering College (China)
- 8193 37 **Pulsed thermography detection of water and hydraulic oil intrusion in the honeycomb sandwich structure composite** [8193-114]
S. Zhao, Beijing Univ. of Aeronautics and Astronautics (China); C. Zhang, Capital Normal Univ. (China); N. Wu, Beijing Univ. of Aeronautics and Astronautics (China)
- 8193 38 **Fabrication of vanadium dioxide polycrystalline films with higher temperature coefficient of resistance** [8193-115]
J. Li, N. Yuan, M. Jiang, L. Kun, Changzhou Univ. (China)
- 8193 39 **Research on readout circuit for PVDF pyroelectric infrared detector** [8193-116]
B. Ye, Shanghai Institute of Technical Physics (China) and Graduate Univ. of Chinese Academy of Sciences (China); Y. Yuan, Shanghai Institute of Technical Physics (China); F. Liu, Shanghai Institute of Technical Physics (China) and Graduate Univ. of Chinese Academy of Sciences (China); X. Li, J. Sun, X. Meng, Shanghai Institute of Technical Physics (China); N. Cai, Shanghai Key Lab. of Criminal Scene Evidence (China)
- 8193 3A **Characterization of CdTe passivation layers grown by evaporation with thermal treatments** [8193-117]
J. Xu, H. Li, X. Chen, Y. Wei, C. Lin, J. Yang, Shanghai Institute of Technical Physics (China)
- 8193 3B **The effect of depth on the quantitative estimation of defect size using pulsed thermography** [8193-118]
T. Feng, C. Zhang, L. Feng, Capital Normal Univ. (China)
- 8193 3C **Stripe noise reduction in MODIS data: a variational approach** [8193-119]
N. Ma, Southeast Univ. (China) and PLA Univ. of Science & Technology (China); Z. Zhou, PLA Univ. of Science & Technology (China); L. Luo, Southeast Univ. (China); M. Wang, PLA Univ. of Science & Technology (China)

- 8193 3D **Analysis of pn-junction degeneration in heating process for extended wavelength InGaAs detectors** [8193-120]
Y. Zhu, H. Deng, P. Wei, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); X. Li, H. Gong, Shanghai Institute of Technical Physics (China)
- 8193 3E **Recognition of distorted target based on Mexican hat optimum trade-off maximum average correlation height algorithm** [8193-121]
J. Shang, C. Chen, W. Wang, Changchun Univ. of Science and Technology (China)
- 8193 3F **In-field stray light due to surface scattering effects in infrared imaging systems** [8193-122]
K. Sun, H. Jiang, X. Cheng, National Univ. of Defense Technology (China)
- 8193 3G **Bonding quality evaluation of wind turbine blades by pulsed thermography** [8193-123]
R. He, D. Kong, Capital Normal Univ. (China); Z. Zeng, Chongqing Normal Univ. (China); N. Tao, C. Zhang, L. Feng, Capital Normal Univ. (China)
- 8193 3H **Design of infrared telephoto lenses for joint transform correlator** [8193-124]
Y. Zhang, J. Shang, Z. Li, W. Wang, Changchun Univ. of Science and Technology (China)
- 8193 3I **A novel junction profile measurement in HgCdTe epilayer by laser beam induced current** [8193-125]
H. Li, J. Xu, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); S. Zhou, C. Lin, L. He, Shanghai Institute of Technical Physics (China)
- 8193 3J **A novel 512x8 ROIC with time-delayed-integration for MW infrared focal plane array** [8193-126]
J. Zhang, Q. Feng, H. Chen, A. Huang, R. Ding, Y. Ni, Shanghai Institute of Technical Physics (China)
- 8193 3K **Identification of spilled oils by NIR spectroscopy technology based on KPCA and LSSVM** [8193-127]
A. Tan, W. Bi, Yanshan Univ. (China)
- 8193 3L **The design and simulation of single detector MIR spectrometer based on MEMS scanning mirror** [8193-128]
Z. Zhang, Z. Wen, T. Zeng, K. Wei, Chongqing Univ. (China)
- 8193 3M **The research of infrared image segmentation based on mathematical morphology** [8193-129]
Y. Wang, Electronic Engineering Institute (China); S. Yin, Electronic Engineering Institute (China) and Tsinghua Univ. (China); X. Wu, Electronic Engineering Institute (China)
- 8193 3N **Research onIRST operating range model for point target based on natural sky background** [8193-130]
J. Wang, W. Jin, Z. Gao, X. Wang, Beijing Institute of Technology (China)
- 8193 3O **Research on the sampling performance of the focal plane array thermal imaging systems** [8193-131]
J. Cui, J. Wang, W. Jin, Z. Gao, T. Bai, Beijing Institute of Technology (China)

- 8193 3P **The effect of infrared and visible image fusion on object tracking using correlation matching** [8193-132]
S. Yin, L. Cao, G. Jin, Tsinghua Univ. (China)
- 8193 3Q **Analysis and design of a low-noise ROIC for hybrid InGaAs infrared FPA** [8193-133]
W. Zhang, S. Huang, Z. Huang, J. Fang, Shanghai Institute of Technical Physics (China)
- 8193 3R **Infrared imaging based on quantum dot optical phase modulation** [8193-134]
G. Chen, Chongqing Univ. (China); T. Yang, Stevens Institute of Technology (United States);
C. Peng, Chongqing Univ. (China); R. Martini, Stevens Institute of Technology (United States)
- 8193 3S **Construction, parameters, and research results of thermal weapon sight** [8193-135]
T. Sosnowski, H. Madura, G. Bieszczad, M. Kastek, K. Chmielewski, Military Univ. of
Technology (Poland)
- 8193 3T **Study of polishing of HgCdTe wafers** [8193-136]
L. Zhang, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese
Academy of Sciences (China); H. Qiao, J. Xu, X. Li, Shanghai Institute of Technical Physics
(China)
- 8193 3U **A new small and dim targets detection and recognition algorithm based on infrared dual
bands imaging system** [8193-137]
B. Wang, G. Lu, Xidian Univ. (China); L. Bai, China Academy of Electronics and Information
Technology (China); Q. Li, Institute of Microelectronics (China); S. Liu, Xidian Univ. (China)
- 8193 3V **Design of readout integrated circuit structure for single and dual band infrared detector with
variable integration time** [8193-138]
T.-P. Sun, Y.-C. Lu, H.-L. Shieh, S.-S. Shiu, Y.-T. Liu, National Chi Nan Univ. (Taiwan); S.-F. Tang,
W.-J. Lin, Chung-Shan Institute of Science & Technology (Taiwan)
- 8193 3W **Electro-optical system for gunshot detection: analysis, concept, and performance**
[8193-139]
M. Kastek, R. Dulski, H. Madura, P. Trzaskawka, G. Bieszczad, T. Sosnowski, Military Univ. of
Technology (Poland)
- 8193 3X **Multisensor systems for security of critical infrastructures: concept, data fusion, and
experimental results** [8193-140]
M. Kastek, R. Dulski, M. Życzkowski, M. Szustakowski, W. Ciurapiński, K. Firmanty, N. Pałka,
G. Bieszczad, Military Univ. of Technology (Poland)
- 8193 3Y **Spectral measurements of muzzle flash with multispectral and hyperspectral sensor**
[8193-141]
M. Kastek, R. Dulski, P. Trzaskawka, T. Piątkowski, H. Polakowski, Military Univ. of Technology
(Poland)
- 8193 3Z **Nonuniformity correction algorithm based on Gaussian mixture model** [8193-142]
X. Mou, G. Zhang, R. Hu, X. Zhou, Huazhong Univ. of Science and Technology (China)

- 8193 40 **Adaptive infrared image enhancement algorithm based on improved UM technique** [8193-143]
X. Wang, Q. Wu, W. Wang, M. He, Air Defense Forces Command Academy (China); Y. Liu, Air Defense Forces Command Academy (China) and Zhejiang Univ. (China)
- 8193 41 **The modulated photocurrent of amorphous HgCdTe thin films** [8193-144]
L. Yu, Y. Shi, J. Zhuang, X. Li, G. Deng, L. Yang, W. He, Kunming Institute of Physics (China)
- 8193 42 **Infrared image enhancement algorithm based on multiscale retinex with adaptive surround space constant** [8193-145]
Y. Liu, Zhejiang Univ. (China) and Air Defense Forces Command Academy (China); X. Wang, J. He, M. He, Y. Zhang, Air Defense Forces Command Academy (China)
- 8193 43 **Analysis and simulation of the infrared characteristics of the aerial target** [8193-146]
S. Ma, X. Li, N. Zhao, Electronic Engineering Institute (China)
- 8193 44 **The characteristic analysis and optimization design for HgCdTe TDI infrared detector array** [8193-147]
M. Dong, X. Chen, G. Qiu, X. Xie, Shanghai Institute of Technical Physics (China)
- 8193 45 **Algebraic nonuniformity correction algorithm based on multiscale optical flow** [8193-148]
M. He, X. Wang, Q. Wu, Air Defense Forces Command Academy (China); Y. Liu, Air Defense Forces Command Academy (China) and Zhejiang Univ. (China); H. Xu, D. Guo, Air Defense Forces Command Academy (China)
- 8193 46 **Modify model for infrared dim target detection** [8193-149]
R. Hu, X. Zhou, Huazhong Univ. of Science and Technology (China); G. Zhang, Luoyang Institute of Electro-optical Equipment (China); G. Zhang, Huazhong Univ. of Science and Technology (China)
- 8193 47 **Spray coater technology in HgCdTe third-generation infrared focal plane arrays** [8193-150]
W. Yin, Shanghai Institute of Technical Physics (China) and Graduate Univ. of the Chinese Academy of Sciences (China); Z. Ye, W. Ma, Y. Chen, X. Hu, Shanghai Institute of Technical Physics (China)
- 8193 48 **Quantitative measurement of screening rate by a thermal imager** [8193-151]
X. Li, S. Ma, N. Zhao, Y. Guo, Electronic Engineering Institute (China)
- 8193 49 **Linear-mode characters of near-infrared wavelength InGaAs APDs for optical communication** [8193-152]
W. He, K. Du, C. Wang, Z. Sun, Y. Jiang, G. Zhai, Ctr. for Space Science and Applied Research (China)
- 8193 4A **The different electrical responses of HgCdTe and InSb photovoltaic infrared detectors under pulsed laser irradiation** [8193-153]
X. Zheng, X. Cheng, T. Jiang, H. Jiang, National Univ. of Defense Technology (China)
- 8193 4B **Small target detection in infrared clutter using dark channel prior and improved local entropy** [8193-154]
Z. Mao, L. Sun, Beijing Univ. of Technology (China); Y. Mao, Univ. of Central Lancashire (United Kingdom); A. Gao, Y. Qin, Beijing Univ. of Technology (China)

- 8193 4C **An inversion algorithm for retrieval of aerosol optical and physical properties from ground-based solar and sky radiance** [8193-155]
L. Qie, Anhui Institute of Optics and Fine Mechanics (China) and Graduate School of the Chinese Academy of Sciences (China); Q. Xu, H. Wei, Anhui Institute of Optics and Fine Mechanics (China)
- 8193 4D **Study on infrared detection data read out technologies** [8193-156]
J. Yu, Beihang Univ. (China) and North Univ. of China (China); Y. An, North Univ. of China (China) and Beihang Univ. (China); S. Bi, Beihang Univ. (China)
- 8193 4E **Study on detecting CFRP composites using pulsed infrared thermography** [8193-157]
Y. Huo, Beijing Institute of Technology (China); H.-J. Li, China Aero-Polytechnology Establishment (China); Y.-J. Zhao, Beijing Institute of Technology (China); C.-L. Zhang, Capital Normal Univ. (China)
- 8193 4F **A grayscale image color transfer method based on region texture analysis using GLCM** [8193-158]
Y. Zhao, L. Wang, W. Jin, Y. Luo, J. Li, Beijing Institute of Technology (China)
- 8193 4G **Experimental study on the responsivity enhancement of $Mn_{1.56}Co_{0.96}Ni_{0.48}O_4$ detector under moderate bias field** [8193-159]
W. Zhou, Y. Hou, Y. Q. Gao, L. Zhang, Z. M. Huang, Shanghai Institute of Technical Physics (China)
- 8193 4H **Prediction of time to go of IR imaging GIF** [8193-160]
M. Fan, Z. Peng, X.-L. Luo, J. Lu, Jinhang Institute of Technical Physics (China)
- 8193 4I **Infrared thermography non-destructive evaluation of lithium-ion battery** [8193-161]
Z. Wang, Z. Li, Q. Liu, Univ. of Electronic Science and Technology of China (China)
- 8193 4J **Study of PZT thick-film infrared detectors prepared by MEMS technology** [8193-162]
X.-P. Qiang, G.-W. Chuan, B.-L. Wen, L.-Z. Wan, Q.-C. Jia, Univ. of Electronic Science and Technology of China (China)
- 8193 4K **Thermal battery infrared monitoring system design based on virtual instrument technology** [8193-163]
Q. Qin, Z. Liu, Shanghai Second Polytechnic Univ. (China); L. Jiang, Shanghai Institute of Space Power Sources (China)
- 8193 4L **Small infrared target detection algorithm based on mathematical morphology** [8193-164]
F. Jiang, M. Jin, L. Song, China Aerospace Science & Industry Corp. (China)
- 8193 4M **Method research on the calculation atmospheric path radiation in foggy weather** [8193-165]
J. Gu, W. Xu, Dalian Maritime Univ. (China)
- 8193 4N **An effective recognition algorithm for multiple targets under sea surface background** [8193-166]
J. Wang, Tianjin Univ. (China) and The JinHang Computational Technology Research Institute (China); B. Zhang, The JinHang Computational Technology Research Institute (China)

- 8193 4O **Denoising approach for remote sensing image based on anisotropic diffusion and wavelet transform algorithm** [8193-167]
X. Wang, W. Lai, North China Electric Power Univ. (China)
- 8193 4P **An airborne thematic thermal infrared and electro-optical imaging system** [8193-168]
X. Sun, Flight Landata, Inc. (United States); P. Shu, NASA Goddard Space Flight Ctr. (United States)
- 8193 4Q **A fast algorithm for wide baseline match basing on feature points filtration** [8193-169]
Z. Zhang, Z. Cao, Huazhong Univ. of Science and Technology (China)
- 8193 4R **A real-time restoring method for infrared images degraded by high-speed airflow** [8193-170]
Q. Mi, J. Fei, C. Chen, Beijing Institute of Electronic Engineering (China)

Author Index

Symposium Committee

Symposium Chairs

Guofan Jin, Tsinghua University (China)
Liwei Zhou, Beijing Institute of Technology (China)
Jingshan Jiang, Center for Space Science and Applied Research (China)
Jianquan Yao, Tianjin University (China)
Shouhuan Zhou, North China Research Institute of Electro-optics (China)
Lianghui Chen, Institute of Semiconductors (China)
Dianyuan Fan, Shanghai Institute of Optics and Fine Mechanics (China)
Junhao Chu, Shanghai Institute of Technical Physics (China)
Qifeng Yu, National University of Defense Technology (China)
Erqi Liu, Academy of Chinese Aerospace Science and Industry Feihang Technology (China)

Organizing Committee

Jinxue Wang, *Chair*, Raytheon Vision Systems (United States)
Yuping Cui, *Chair*, Academy of Chinese Aerospace Science and Industry Feihang Technology (China)
Zhixin Wu, *Chair*, Tianjin Jinhang Institute of Technical Physics (China)
Xiaopeng Wang, *Chair*, Xi'an Institute of Applied Optics (China)
Weibiao Chen, Shanghai Institute of Optics and Fine Mechanics (China)
Haimei Gong, Shanghai Institute of Technical Physics (China)
Yuelin Wang, State Key Laboratory of Transducer Technology (China)
Zhaojun Liu, Beijing Institute of Space Mechanics and Electricity (China)
Bo Liu, Beijing Huahang Radio Measurement and Research Institute (China)
Nianjiang Chen, North China Research Institute of Electro-optics (China)
Guangjun Zhang, Beihang University (China)
Jiancheng Fang, Beihang University (China)
Qian Chen, Nanjing University of Science and Technology (China)
Ping Wei, Beijing Institute of Technology (China)
Pu Wang, Beijing University of Technology (China)
Kecong Ai, Xi'an Institute of Applied Optics (China)
Heguang Liu, Key Laboratory of Microwave Remote Sensing (China)
Jindong Fei, Beijing Simulation Center (China)

Program Committee

Guofan Jin, *Chair*, Tsinghua University (China)
Jingshan Jiang, *Chair*, Center for Space Science and Applied Research (China)
Jianquan Yao, *Chair*, Tianjin University (China)
Junhao Chu, *Chair*, Shanghai Institute of Technical Physics (China)
Qifeng Yu, *Chair*, National University of Defense Technology (China)
Zhihong Wang, North Night Vision Technology Company, Ltd. (China)
Yuelin Wang, State Key Laboratory of Transducer Technology (China)
Pu Wang, Beijing University of Technology (China)
Jin Lu, Tianjin Jinhang Institute of Technical Physics (China)
Kecong Ai, Xi'an Institute of Applied Optics (China)
Feng Liu, Tianjin Jinhang Institute of Technical Physics (China)
Nanjian Wu, Institute of Semiconductors (China)
Guangjun Zhang, Beijing University of Aeronautics and Astronautics (China)
Cunlin Zhang, Capital Normal University (China)
Jianfeng Yang, Xi'an Institute of Optics and Precision Mechanics (China)
Weibiao Chen, Shanghai Institute of Optics and Fine Mechanics (China)
Qian Chen, Nanjing University of Science and Technology (China)
Jiancheng Fang, Beijing University of Aeronautics and Astronautics (China)
Chunqing Gao, Beijing Institute of Technology (China)
Haimei Gong, Shanghai Institute of Technical Physics (China)
Rong Shu, Shanghai Institute of Technical Physics (China)
Tianyu Xie, Peking University (China)

Conference Committee

Conference Chairs

Jeffery J. Puschell, Raytheon Space and Airborne Systems (United States)
Junhao Chu, Shanghai Institute of Technical Physics (China)
Haimei Gong, Shanghai Institute of Technical Physics (China)
Jin Lu, Tianjin Jinhang Institute of Technology Physics (China)

Program Committee

H. C. Liu, Shanghai Jiao Tong University (Canada)
Masafumi Kimata, Ritsumeikan University (Japan)
Daniel K. Zhou, NASA Langley Research Center (United States)
Xu Liu, NASA Langley Research Center (United States)
Allen Larar, NASA Langley Research Center (United States)
Allen Huang, University of Wisconsin Space Science Engineering Center (United States)
Dayan Ban, University of Waterloo (Canada)
S. Sivananthan, University of Illinois at Chicago (United States)
Yanli Shi, Kunming Institute of Physics (China)
Haibo Luo, Shenyang Institute of Automation (China)
Jinwen Tian, Huazhong University of Science and Technology (China)
Jindong Fei, Science and Technology on Space System Simulation Laboratory, Beijing Simulation Center (China)
Qian Chen, Nanjing University of Science and Technology (China)
Wei Lu, Shanghai Institute of Technical Physics (China)
Wenquan Ma, Institute of Semiconductors (China)
Jianxin Chen, Shanghai Institute of Technical Physics (China)

Introduction

We have had the great honor to organize the 4th International Symposium on Photoelectronic Detection and Imaging in Beijing; it follows ISPD12009 held also in Beijing in 2009. More than 1000 participants attended ISPD1 2011. The symposium provided a forum for the participants to report and review ideas and up-to-date comprehensive progress and developments and to discuss the novel approaches to application areas in the field of photoelectronic detection and imaging.

There were 720 papers accepted for presentation at ISPD1 2011, contributed by over 1,200 authors from nearly 20 countries, including: United States, Canada, Russia, United Kingdom, Germany, Ireland, Belgium, Poland, Czech Republic, South Africa, Australia, Korea, Japan, India, Malaysia, Singapore, China, and so on. We have nearly 100 international famous scientists and experts as invited speakers. The invited papers covered topics such as sensor and micromachined optical device technologies, laser sensing and imaging, infrared imaging and applications, imaging detector and applications, terahertz wave technologies and applications, space exploration technologies and applications, and related technologies and applications. It is sincerely hoped that the research and development in photoelectronic detection and imaging will be promoted, and the international cooperation sharing the common interest will be enhanced.

I would like to heartily to thank our sponsors and cooperative organizations for all they have done for the symposium. Thanks also to all the authors for their contributions to these proceedings, to all of the participants and friends for their interest and efforts in helping to make the symposium possible, to the organizing committee and the program committee for their effective work and valuable advice, especially the ISPD12011 Secretariat, and to the SPIE staff for their tireless effort and outstanding service in preparing and publishing the conference proceedings.

Again, we extend our warmest greetings to you and hope you have had a rewarding and exciting stay during ISPD1 2011.

Guofan Jin

Local Cooperating Organizations of ISPD1 2011

Shanghai Institute of Optics and Fine Mechanics, CAS (China)
Shanghai Institute of Technical Physics, CAS (China)
Beijing Institute of Space Mechanics and Electricity (China)
Beijing Huahang Radio Measurement and Research Institute (China)
North China Research Institute of Electro-optics (China)
Beijing University of Aeronautics and Astronautics (China)
Nanjing University of Science and Technology (China)
Beijing Institute of Technology (China)
Beijing University of Technology (China)
State Key Laboratory of Transducer Technology (China)
Science and Technology on Micro-system Laboratory (China)
The Key Laboratory of Microwave Remote Sensing, CAS (China)
Science and Technology on Space System Simulation Laboratory, Beijing
Simulation Center (China)

