

PROCEEDINGS OF SPIE

Infrared, Millimeter-Wave, and Terahertz Technologies IV

Cunlin Zhang
Xi-Cheng Zhang
Masahiko Tani
Editors

12–14 October 2016
Beijing, China

Sponsored by
SPIE
COS—Chinese Optical Society

Cooperating Organizations
Tsinghua University (China) • Peking University (China) • University of Science and Technology of China (China) • Zhejiang University (China) • Tianjin University (China) • Beijing Institute of Technology (China) • Beijing University of Posts and Telecommunications (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) • Optical Society of Japan (Japan) • Optical Society of Korea (Korea, Republic of) • The Australian Optical Society (Australia) • Optics and Photonics Society of Singapore (Singapore) • European Optical Society

Supporting Organizations
CAST—China Association for Science and Technology (China)
NSFC—National Nature Science Foundation (China)

Published by
SPIE

Volume 10030

Proceedings of SPIE 0277-786X, V. 10030

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

Infrared, Millimeter-Wave, and Terahertz Technologies IV, edited by Cunlin Zhang, Xi-Cheng Zhang, Masahiko Tani, Proc. of SPIE Vol. 10030, 1003001 · © 2016 SPIE
CCC code: 0277-786X/16/\$18 · doi: 10.1117/12.2264865

Proc. of SPIE Vol. 10030 1003001-1

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 SPIDigitalLibrary.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 this book:

Author(s), "Title of Paper," in *Infrared, Millimeter-Wave, and Terahertz Technologies IV*, edited by Cunlin Zhang, Xi-Cheng Zhang, Masahiko Tani, Proceedings of SPIE Vol. 10030 (SPIE, Bellingham, WA, 2016) Article CID Number.

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510604797
ISBN: 9781510604803 (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 the United States of America.

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

SPIE. DIGITAL LIBRARY
SPIDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. 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

- vii *Authors*
- xi *Symposium Committees*
- xiii *Conference Committee*

THZ GENERATION AND DETECTORS I

- 10030 05 **Terahertz pulse generation from metal nanoparticle ink (Invited Paper)** [10030-4]

THZ GENERATION AND DETECTORS II

- 10030 09 **High sensitive THz superconducting hot electron bolometer mixers and transition edge sensors (Invited Paper)** [10030-8]
- 10030 0B **High-repetition-rate, widely tunable terahertz generation in GaSe pumped by a dual-wavelength KTP-OPO** [10030-10]
- 10030 0C **THz wave parametric oscillator with a surface-emitted ring-cavity configuration** [10030-11]
- 10030 0D **Performance of a mmWave beamformed phased array system for indoor LOS communication** [10030-12]

THZ SPECTROSCOPY I

- 10030 0J **Feasibility study of determination of high-fructose syrup content of Acacia honey by terahertz technique** [10030-18]

THZ IMAGING

- 10030 0Q **New progress of active and passive terahertz imaging (Invited Paper)** [10030-25]

THZ DEVICES AND PROPAGATION I

- 10030 0T **Integrated terahertz optoelectronics (Invited Paper)** [10030-28]

INFRARED

- 10030 0X **Infrared spectroscopy assisted by entangled photons (Invited Paper)** [10030-32]
- 10030 0Z **Measurement of high-temperature spectral emissivity using integral blackbody approach** [10030-34]
- 10030 10 **Analytic technology of infrared absorption spectrum based on time-frequency analysis** [10030-35]
- 10030 11 **Using hyperspectral imaging technology to identify diseased tomato leaves** [10030-36]
- 10030 12 **TDDA technology for high spatial resolution SWIR InGaAs imaging** [10030-37]
- 10030 13 **Tunable mid-infrared emission from acetylene-filled hollow-core fiber** [10030-38]
- 10030 14 **The initial design of LAPAN's IR micro bolometer using mission analysis process** [10030-39]
- 10030 15 **A design on low noise imaging circuit for SWIR sensor** [10030-50]

THZ DEVICES AND PROPAGATION II

- 10030 16 **Optical feedback effects on terahertz quantum cascade lasers: modelling and applications (Invited Paper)** [10030-40]
- 10030 17 **Localized spoof surface plasmon resonances at terahertz range** [10030-41]
- 10030 19 **Terahertz beam shaping with metasurface** [10030-43]

OTHERS

- 10030 1A **Terahertz magnetic and electric Mie resonances of an all-dielectric one-dimensional grating and their sensing capability (Invited Paper)** [10030-44]
- 10030 1B **Multicasting of signal-carrying Gaussian mode to multiple orbital angular momentum (OAM) modes (Invited Paper)** [10030-70]
- 10030 1C **Gas trace detection with cavity enhanced absorption spectroscopy: a review of its process in the field** [10030-46]
- 10030 1D **Ripple FPN reduced algorithm based on temporal high-pass filter and hardware implementation** [10030-47]

POSTER SESSION

- 10030 1E **A high-speed and low-noise intelligent test system for infrared detectors** [10030-48]
- 10030 1G **Oil spill detection using hyperspectral infrared camera** [10030-51]

- 10030 1H **Analyzing terahertz time-domain transmission spectra with multi-beam interference principle** [10030-52]
- 10030 1I **A novel wavefront-based algorithm for numerical simulation of quasi-optical systems** [10030-53]
- 10030 1J **Cost-effective bidirectional digitized radio-over-fiber systems employing sigma delta modulation** [10030-54]
- 10030 1M **Active terahertz wave imaging system for detecting hidden objects** [10030-57]
- 10030 1N **Terahertz spectroscopy of different types of water** [10030-58]
- 10030 1O **Widely-tunable terahertz parametric oscillator based on MgO-doped near-stoichiometric LiNbO₃ crystal** [10030-59]
- 10030 1Q **Compact high-repetition-rate terahertz source based on difference frequency generation from an efficient 2- μ m dual-wavelength KTP OPO** [10030-61]
- 10030 1R **The properties of electromagnetic responses and optical modulation in terahertz metamaterials** [10030-62]
- 10030 1S **Wavelength scaling of terahertz radiation in plasma gas targets** [10030-63]
- 10030 1T **Wavelength scaling of terahertz generation via two color photoionization in pre-formed plasma** [10030-64]
- 10030 1U **Chirped distributed Bragg reflector for broad-band group velocity dispersion compensation in terahertz quantum cascade lasers** [10030-65]
- 10030 1V **A fast detection method for small weak infrared target in complex background** [10030-66]
- 10030 1W **An improved hyperspectral image classification approach based on ISODATA and SKR method** [10030-67]
- 10030 1Y **Spectral radiance characteristic measure method based on passive imaging FTIR spectrometer** [10030-69]
- 10030 1Z **A fast pyramid matching algorithm for infrared object detection based on region covariance descriptor** [10030-71]
- 10030 21 **A novel visible and infrared image fusion algorithm based on detail enhancement** [10030-73]
- 10030 22 **Terahertz characteristics of graphene deposited on different substrates** [10030-74]
- 10030 24 **Standoff gas identification and application with FTIR imaging spectrometer** [10030-76]
- 10030 25 **Spectra modulation of terahertz radiation from air plasma** [10030-77]
- 10030 26 **Vibrational spectral investigation of anhydrous glucose in the terahertz range** [10030-78]

- 10030 27 **The design of circuit for THz time domain spectroscopy system based on asynchronous optical sampling** [10030-79]
- 10030 28 **Research on trace gas measurement by ICOS with WMS** [10030-80]
- 10030 29 **Investigation on optical properties of BSA protein on single-layer graphene using terahertz spectroscopy technology** [10030-81]
- 10030 2A **Terahertz wavelength encoding compressive imaging** [10030-82]
- 10030 2B **Terahertz microfluidic chips for detection of amino acids in aqueous solutions** [10030-83]
- 10030 2C **Simulation study of microstrip line in on-chip THz system** [10030-84]
- 10030 2D **The birefringence of two liquid crystals in terahertz band** [10030-85]
- 10030 2E **Nitrocellulose membrane sample holder using for terahertz time domain spectroscopy** [10030-86]
- 10030 2F **Design and research for biosensing THz microfluidic chips** [10030-87]
- 10030 2G **Investigation of transient temperature's influence on damage of high-speed sliding electrical contact rail surface** [10030-88]
- 10030 2I **Detection of NaCl solutions using terahertz time domain spectroscopy** [10030-90]
- 10030 2K **Design and simulation of a tunable metamaterial absorber** [10030-92]
- 10030 2L **Electrically controlled terahertz wave switch based on prism/liquid crystal** [10030-93]
- 10030 2M **Tunable terahertz power divider based on graphene plasmonic waveguide** [10030-94]
- 10030 2N **Pepper seed variety identification based on visible/near-infrared spectral technology** [10030-95]
- 10030 2O **Research of biological liquid albumin based on terahertz time domain spectroscopy** [10030-96]
- 10030 2P **Processing and fusion for human body terahertz dual-band passive image** [10030-97]
- 10030 2Q **Detailed signal model of coherent wind measurement lidar** [10030-98]
- 10030 2R **Primary study on scattering property for irregular suspended particles in water with T-matrix theory** [10030-99]
- 10030 2S **Performance of passive terahertz imaging system** [10030-100]
- 10030 2T **Research on THz stepped-frequency ISAR imaging** [10030-101]
- 10030 2U **FPGA based hardware optimized implementation of signal processing system for LFM pulsed radar** [10030-102]

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.

A., Bustanul, 14
Agnew, Gary, 16
Amjad, Kinnan, 0D
Azim, Noor ul, 2U
B., Firman, 14
Ban, D., 1U
Bertling, Karl, 16
Bloembergen, Pieter, 0Z
Cai, Jichen, 2N
Cai, Yi, 2P
Cai, Yu-fei, 1W
Chen, Chao, 10
Chen, Huawang, 1Y
Chen, Lin, 17
Chen, Wei, 1R
Chen, Yubin, 13
Cui, Bin, 1A
Cui, Hailin, 27
Cui, Kun, 1E
Davies, A. Giles, 16
Demić, Aleksandar, 16
Dong, Shuli, 15
Dong, Wei, 0Z
Du, Pengju, 29
Du, Zhenhui, 10
Duan, Pan, 0C, 1O
Fan, Ben, 15
Fan, Ning, 2B, 2C, 2F
Fan, Pengfei, 2N
Feng, Peng, 2R
Ferguson, Blake, 16
Fu, Yanan, 2K
Gan, Yuner, 1M
Gao, Nan, 10
Gong, Chen, 22
Grier, Andrew, 16
Guo, Quanli, 2G
Guo, X. H., 09
Han, Donghai, 0J
Han, She, 16
Han, Zhixue, 15
Harrison, Paul, 16
He, Jingsuo, 27
He, Jingwen, 19
He, Meng-yao, 2L
He, Yixin, 1O
Hong, Pu, 1V, 1W
Hu, Jian-rong, 2L, 2M
Hu, Jie, 1I
Huang, Suxia, 1S, 1T
Ikonić, Zoran, 16
Indjin, Dragan, 16
Jia, Guowei, 1Y
Jia, Jianxin, 12
Jia, Tianshi, 1E
Jin, Minglei, 1D
Jin, Weiqi, 1D, 2P
Jun, Wang, 2U
Jung, HyunDo, 1J
Kalashnikov, Dmitry A., 0X
Kato, Kosaku, 05
Keeley, James, 16
Kong, Fansheng, 1E
Kong, Lingqin, 2D
Krivitsky, Leonid A., 0X
Kulik, Sergei P., 0X
Kundu, Iman, 16
Lee, Kyung Woon, 1J
Lei, Bo, 1V, 1Y
Li, Biao, 24
Li, Chenyu, 2D
Li, Cuiling, 11, 2N
Li, Jiu-sheng, 2L, 2M
Li, Lianhe H., 16
Li, Shuhui, 1B
Li, Shuo, 1D
Li, Sining, 2Q
Li, Yang, 2M
Li, Yihan, 27
Li, Yiyang, 1D
Li, Yonghua, 2K
Li, Zhixian, 13
Liang, Guozhen, 0T
Liang, Juan, 1Y
Liang, Meiyang, 2T
Lim, Yah Leng, 16
Lin, Hong, 0Z
Linfield, Edmund H., 16
Liu, Chongcheng, 1V
Liu, Chu, 1H
Liu, Jing, 1N
Liu, Ming, 1M
Liu, Pengxiang, 0B, 1Q
Liu, Shangjian, 2E, 2I, 2O
Liu, Siqi, 1C
Liu, Wei, 26
Liu, Wen, 0J
Liu, Xiyang, 10

Liu, Yanan, 2R
 Long, Xingwu, 1C
 Lou, Zheng, 1I
 Lu, Wei, 2Q
 Lung, Shaun, 0X
 Luo, Zhifu, 1C
 M. T., Andi, 14
 Ma, Fei, 15
 Ma, Pin, 1A
 Ma, Yuechao, 2Q
 Mei, Jialin, 0B, 1Q
 Meng, Zhijun, 11, 2N
 Miao, W., 09
 Mu, Kaijun, 22
 Nakajima, Makoto, 05
 Ni, Zhenglong, 28
 Nie, Meitong, 1O
 Norwood, Robert A., 1Q
 P., Irwan, 14
 Pan, Yijie, 0Z
 Park, Jung Ho, 1J
 Paterova, Anna V., 0X
 Peng, Yan, 17
 Peyghambarian, Nasser, 1Q
 Phan, Thanh Nhat Khoa, 05
 Prow, Tarl, 16
 Qi, Xiaoqiong, 16
 Rakić, Aleksandar D., 16
 Shao, Jie, 28
 Shen, Yanchun, 0Q, 2P
 Sheng, Quan, 0B
 Shi, Jia, 0B, 1O
 Shi, Shengcai, 09, 1I
 Shi, Wei, 0B, 1H, 1Q
 Shi, Yulei, 1R
 Shu, Rong, 12
 Soyer, H. Peter, 16
 Su, Bo, 2B, 2C, 2F
 Sun, Dongtao, 2G
 Sun, Gangbo, 1V
 Sun, Huijuan, 2D
 Sun, Ping, 26
 Sun, Shasha, 2G
 Sun, Wei, 24
 Sun, Wenfeng, 25
 Sun, Yiwen, 29
 Tadokoro, Yuzuru, 05
 Taimre, Thomas, 16
 Takano, Keisuke, 05
 Tan, Zhongqi, 1C
 Tang, Longhuang, 0C, 1O
 Tang, Wei, 1G, 1W, 24
 Tang, Xin, 1G, 1W
 Tian, Li, 2P
 Valavanis, Alexander, 16
 Walker, Graeme, 16
 Wang, Bo, 1V, 1Y, 21
 Wang, Chen-sheng, 1G, 1W, 1Y, 24
 Wang, Cuicui, 2E, 2I
 Wang, Jia, 0Q, 2S
 Wang, Jian, 1B
 Wang, Jianyu, 12
 Wang, Kunyang, 28
 Wang, Liyan, 1A
 Wang, Maorong, 1H, 1Q
 Wang, Peng, 24
 Wang, Qi Jie, 0T
 Wang, Qun, 1G
 Wang, Ruike, 27
 Wang, Sen, 19
 Wang, Shengwei, 12
 Wang, Wei, 1R
 Wang, Wenai, 26
 Wang, Xiao, 1Z
 Wang, Xinke, 2A
 Wang, Xiu, 11, 2N
 Wang, Yueming, 12
 Wang, Yuye, 0B, 0C, 1H, 1O, 1Q
 Wang, Zefeng, 13
 Wilson, Stephen J., 16
 Wu, Lei, 1D
 Xie, Jiang-rong, 1Z
 Xie, Yijun, 26
 Xu, C., 1U
 Xu, Degang, 0B, 0C, 1H, 1O, 1Q
 Xu, Huaping, 0D
 Xu, Mengjian, 17
 Xu, Wentao, 0C, 1O
 Xu, Yin, 1V
 Xue, Yulong, 1E
 Yan, Chao, 0B, 0C, 1O
 Yan, Dexian, 0B
 Yang, Degong, 2G
 Yang, Shengxin, 29
 Yang, Shuai, 2O
 Yang, Yuping, 1A
 Yang, Zhen, 0C, 1O
 Yao, Jianquan, 0B, 0C, 1H, 1O, 1Q
 Yao, Yi, 12
 Ye, Xiao-feng, 1W
 Yin, Li-hua, 1Z
 Yu, Hui, 1G, 1W, 24
 Yu, Jiayi, 0Q
 Yuan, Zundong, 0Z
 Yue, Song, 1G, 1V, 1Y
 Zang, Xiaofei, 17
 Zhang, Cong, 2B, 2C, 2F
 Zhang, Cun-lin, 1N, 1R, 1S, 1T, 22, 27, 2B, 2C, 2D,
 2E, 2F, 2I, 2O, 2T
 Zhang, Liangliang, 1S, 1T
 Zhang, Mile, 27
 Zhang, Naqian, 13
 Zhang, Qiong, 2A
 Zhang, W., 09
 Zhang, Xiaoling, 11
 Zhang, Yan, 19, 25, 2A
 Zhang, Ying, 25
 Zhang, Yuyan, 2G
 Zhang, Yuying, 0J
 Zhang, Zhen, 1G, 24

Zhang, Zhiheng, 2T
Zhang, Zhi-je, 1G, 1W, 1Y, 24
Zhang, Zhipeng, 1D
Zhang, Zonghua, 10
Zhao, Ding, 12
Zhao, Guozhong, 0Q, 2K, 2P, 2S
Zhao, Hang, 1S, 1T
Zhao, Xiaojing, 2E, 2I
Zhao, Xueguan, 11
Zhao, Yuejin, 1M, 2D
Zhong, J. Q., 09
Zhong, Kai, 0B, 1H, 1Q
Zhou, Haibo, 28
Zhou, Kangmin, 09, 1I
Zhou, Nan, 1B
Zhou, Qingli, 1R, 2D
Zhou, Zhiyue, 13
Zhu, Yiming, 17
Zhuang, Xiaoqiong, 12
Zou, Wei, 11
Zuo, Jian, 1N, 22, 2E, 2I, 2O
Zuo, Yingxi, 1I

Symposium Committees

General Chairs

Robert Lieberman, SPIE President, Lumoptix, LLC (United States)
Guangcan Guo, Chinese Optical Society President, University of
Science and Technology of China (China)

General Co-chairs

Arthur Chiou, National Yang-Ming University (Taiwan, China)
Jianlin Cao, China Ministry of Science and Technology (China)
Junhao Chu, Shanghai Institute of Technical Physics (China)

Technical Program Chairs

Songlin Zhuang, University of Shanghai for Science and Technology
(China)
Xingde Li, Johns Hopkins University (United States)

Technical Program Co-chairs

Bingkun Zhou, Tsinghua University (China)
Qiming Wang, Institute of Semiconductors (China)
Tianchu Li, National Institute of Metrology (China)
Wei Huang, Nanjing University of Technology (China)
Ying Gu, PLA General Hospital (China)
Huilin Jiang, Changchun University of Science and Technology
(China)

Local Organizing Committee Chair

Qihuang Gong, Peking University (China)

Local Organizing Committee Co-chairs

Xu Liu, Zhejiang University (China)
Daoyin Yu, Tianjin University (China)
Guoqiang Ni, Beijing Institute of Technology (China)
Shusen Xie, Fujian Normal University (China)
Xiaomin Ren, Beijing University of Posts and Telecommunications
(China)

General Secretary

Yan Li, Chinese Optical Society/Peking University (China)

Local Organizing Committee

Zhiping Zhou, Peking University (China)
Changhe Zhou, Shanghai Institute of Optics and Fine Mechanics, CAS
(China)
Qingming Luo, Huazhong University of Science and Technology
(China)
Chongxiu Yu, Beijing University of Posts and Telecommunication
(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)
Wei Xiong, Chinese Optical Society (China)

Conference Committee

Symposium Chairs

Robert A. Lieberman, SPIE President, Lumoptix, LLC (United States)
Wei Xiong, Chinese Optical Society (China)

Conference Chairs

Cunlin Zhang, Capital Normal University (China)
Xi-Cheng Zhang, University of Rochester (United States)
Masahiko Tani, University of Fukui (Japan)

Conference Program Committee

Peter A.R. Ade, Cardiff University (United Kingdom)
Yi Cai, Kunming Institute of Physics (China)
Jun-Cheng Cao, Shanghai Institute of Microsystem and Information Technology (China)
Hou-Tong Chen, The Center for Integrated Nanotechnologies (United States)
Jian Chen, Nanjing University (China)
Yuping Cui, Tianjin Jinhang Institute of Technology Physics (China)
Jianming Dai, University of Rochester (United States)
Haewook Han, Pohang University of Science and Technology (Korea, Republic of)
Jiaguang Han, Tianjin University (China)
Zhi Hong, China Jiliang University (China)
Biaobing Jin, Nanjing University (China)
WeiQi Jin, Beijing Institute of Technology (China)
Sergei Ark Kozlov, National Research University of Information Technologies, Mechanics and Optics (Russian Federation)
He Li, Shanghai Institute of Technical Physics (China)
Jinsong Liu, Huazhong University of Science and Technology (China)
Makoto Nakajima, Osaka University (Japan)
Chiko Otani, RIKEN (Japan)
Ci-Ling Pan, National Tsing Hua University (Taiwan, China)
Jiancheng Shi, Institute of Remote Sensing and Digital Earth (China)
Sheng-Cai Shi, Purple Mountain Observatory (China)
Alexander Pavlovich Shkurinov, Lomonosov Moscow State University (Russian Federation)
Fei-jun Song, China Daheng Group, Inc. (China)
Jianmin Yuan, National University of Defense Technology (China)
Chao Zhang, University of Wollongong (Australia)
Weili Zhang, Oklahoma State University (United States)

Yan Zhang, Capital Normal University (China)
Zhuoyong Zhang, Capital Normal University (China)
Kun Zhao, China University of Petroleum (China)
YiMing Zhu, University of Shanghai for Science and Technology
(China)

Session Chairs

- 1 THz Generation and Detectors I
Masahiko Tani, University of Fukui (Japan)
- 2 THz Generation and Detectors II
Xi-Cheng Zhang, University of Rochester (United States)
- 3 THz Spectroscopy I
Zheng-Ming Sheng, Shanghai Jiao Tong University (China)
- 4 THz Spectroscopy II
Chao Zhang, University of Wollongong (Australia)
- 5 THz Imaging
Cunlin Zhang, Daheng New Epoch Technology, Inc. (China)
- 6 THz Devices and Propagation I
Yan Zhang, Capital Normal University (China)
- 7 Infrared
Guozhong Zhao, Capital Normal University (China)
- 8 THz Devices and Propagation II
Guanjun You, University of Shanghai for Science and Technology
(China)
- 9 Others
Xinke Wang, Capital Normal University (China)