## PROCEEDINGS OF SPIE

# AOPC 2023: Optical Spectroscopy and Imaging; and Atmospheric and Environmental Optics

Yutao Feng Zongyin Yang Dong Liu Editors

25–27 July 2023 Beijing, China

Sponsored by Chinese Society for Optical Engineering (CSOE) (China)

Technical Cosponsor SPIE

Organized by Laser Technology Committee, CSOE (China) Infrared Technology Committee, CSOE (China) THz Technology Committee, CSOE (China) Imaging and Detection Technology Committee, CSOE (China) Advanced Optical Manufacturing Youth Expert Committee, CSOE (China)

Published by SPIE

Volume 12962

Proceedings of SPIE 0277-786X, V. 12962

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

AOPC 2023: Optical Spectroscopy and Imaging; and Atmospheric and Environmental Optics, edited by Yutao Feng, Zongyin Yang, Dong Liu, Proc. of SPIE Vol. 12962, 1296201 · © 2023 SPIE · 0277-786X · doi: 10.1117/12.3022857 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 AOPC 2023: Optical Spectroscopy and Imaging; and Atmospheric and Environmental Optics, edited by Yutao Feng, Zongyin Yang, Dong Liu, Proc. of SPIE 12962, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510672307 ISBN: 9781510672314 (electronic)

Published by **SPIE** P.O. Box 10, Bellingham, Washington 98227-0010 USA Telephone +1 360 676 3290 (Pacific Time) SPIE.org Copyright © 2023 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

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



**Paper Numbering:** A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE 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

v Conference Committee

#### OPTICAL SPECTROSCOPY AND IMAGING

12962 02	Mineral information recognition based on simulated high spatial resolution full spectrum remote sensing images [12962-1]
12962 03	Laser-induced breakdown spectroscopy combined with KNN for tracing study of soils from different regions [12962-3]
12962 04	Research on accuracy and optimization for some baseline removal algorithms for high-throughput experiments [12962-4]
12962 05	Effective framework for space target detection through atmospheric turbulence [12962-5]
12962 06	Spectral intersection over union: a bounding box overlap metric for hyperspectral object detection [12962-7]
12962 07	Analysis of the key techniques in polarization feature extraction and correction [12962-8]
12962 08	<b>Resolution enhancement in retro-reflector based on aerial imaging using micro aperture arrays</b> [12962-13]
12962 09	Study on identification method for Artemisia argyi floss [12962-14]
12962 0A	Identification of nuclear materials using portable laser-induced plasma spectroscopy [12962-15]
12962 OB	BRDF modeling and analysis of the pseudo-invariant calibration site in northwest China [12962-22]
12962 OC	Design of photonic-crystal-modulated narrowband multichannel filters for visible light with high transmittance [12962-24]
12962 OD	A micro-multispectral vision sensor: research on on-line measurement classification and recognition method of coal gangue [12962-29]
12962 OE	Detection of deuteroxide by dual-wavelength Raman spectroscopy [12962-31]
12962 OF	Influence of deformed window glass for GaAs photocathode on light transmission [12962-32]

12962 OG A miniature Fourier transform spectrometer based on an electrothermal MEMS mirror with asynchronous calibration [12962-34]

12962 OH Study on spectral characteristics of smoke interference unit [12962-38]

#### ATMOSPHERIC AND ENVIRONMENTAL OPTICS

12962 01	Research on interference suppression methods for indoor visible light communication [12962-2]
12962 OJ	Design of automatic coupling system based on all-fiber water vapor Raman lidar [12962-6]
12962 OK	Effect of multicomponent alloy coating on high frequency plasma ablation of diamond films [12962-9]
12962 OL	Earth-to-satellite laser long-path absorption measurement of atmospheric trace gases [12962-10]
12962 OM	An improved calibration method and detection error simulation for three-wavelength polarization lidar systems [12962-11]
12962 ON	Experimental study on atmospheric polarization characteristics measurement with different observation angles and wavelengths [12962-16]

### **Conference Committee**

Conference Chairs

 Yutao Feng, Xi'an Institute of Optics and Precision Mechanics (China)
 Zongyin Yang, Zhejiang University (China)
 Dong Liu, Anhui Institute of Optics and Fine Mechanics, Chinese Academy of Sciences (China)

#### Program Committee

Ravil Agishev, Kazan State Power Engineering University (Russia)
Mehdi Afshari Bavil, Razi University (Iran)
Lei Bi, Zhejiang University (China)
Jintian Bian, National University of Defense Technology (China)
Lu Lu, Nanjing Normal University (China)
Dongfeng Shi, Hefei Institutes of Physical Science (China)
Zhongwen Hu, Nanjing Institute of Astronomical Optics & Technology (China)
Yiting Yu, Northwestern Polytechnical University (China)
Chunlai Li, Shanghai Institute of Technical Physics (China)
Zhipei Sun, Aalto University (Finland)