PROCEEDINGS OF SPIE

AOPC 2025: Optical Design, Testing, and Manufacturing

Lingbao Kong
Editor

24–27 June 2025
Beijing, China

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

Technical Cosponsor
SPIE

Published by
SPIE

Volume 13960

Proceedings of SPIE 0277-786X, V. 13960

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 2025: Optical Design, Testing, and Manufacturing*, edited by Lingbao Kong, Proc. of SPIE 13960, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

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

ISBN: 9781510698642
ISBN: 9781510698659 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org

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.

SPIE. DIGITAL LIBRARY
SPIEDigitalLibrary.org

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

vii *Conference Committee*

OPTICAL DESIGN AND MANUFACTURING

13960 02 **Research on visual response performance of color parameters in aircraft cockpit display interface under complex light environment** [13960-1]

13960 03 **Modeling of CH_4/H_2/Ar plasma in dry etching of CdZnTe microlens array** [13960-2]

13960 04 **Design and development of a hybrid confocal-interferometric probe system with common path** [13960-3]

13960 05 **Design of DPP EUV exposure detection device** [13960-4]

13960 06 **Optical performance prediction and reverse design of phosphor LEDs using deep neural networks optimized by genetic algorithms** [13960-5]

13960 07 **Research and development of point-focusing x-ray curved crystal monochromator based on microfocus x-ray source** [13960-6]

13960 08 **Analysis of imaging quality and parameters for flexible variable-focus cylindrical lens under dynamic external force drive** [13960-7]

13960 09 **Design and analysis of propagation phase polarization multiplexed dielectric metalenses** [13960-8]

13960 0A **Prediction of scattering caused by fabrication errors in micro-field EUVL projection optics** [13960-9]

13960 0B **Curved glass thickness measurement method based on line spectral confocal principle** [13960-11]

13960 0C **Design of a reflective mirror structure based on an improved multiobjective animated oat optimization algorithm** [13960-13]

13960 0D **Study on the surface mechanical properties and polishing process of magnesium aluminate spinel** [13960-14]

13960 0E **DMD diffraction propagation model and frequency-domain energy optimization under incoherent illumination** [13960-16]

13960 0F **A study of trajectory planning for in situ measurements of hemispherical shell resonator geometric error** [13960-18]

13960 0G **Structure design and verification of lightweight rectangular folding mirror** [13960-19]

13960 0H **Atomic level processing mechanism and analysis of CaF_2 crystal nanoindentation by molecular dynamics simulation** [13960-22]

13960 0I **Structural and dielectric modification of aluminum nanohole arrays for surface plasmon resonance** [13960-23]

13960 0J **Modeling of the removal function for oblique-axis polishing of single-crystal silicon with a robotic arm** [13960-25]

13960 0K **Design method of an ultra-thin two-dimensional hybrid waveguide near-eye display based on forward-ray-tracing and global optimization algorithm** [13960-26]

13960 0L **Thermal focus shift in high-power laser image transfer system** [13960-27]

13960 0M **Development of mid-wave infrared antireflection coating based on $Ge_{10}Se_{50}As_{40}$ chalcogenide glass** [13960-28]

13960 0N **The impact of internal random fluctuating vacuum channels on the emission performance of photocathode** [13960-31]

13960 0O **A highly stable synthetic wavelength phase demodulation algorithm for multiwavelength interferometric ranging** [13960-34]

13960 0P **Comparative study of forward- and backward-scattered light for subsurface-defect detection in nonfluorescent materials** [13960-35]

13960 0Q **Optical system design and active alignment methods for wide-field astronomical telescopes** [13960-36]

13960 0R **Research on the influence of support and bonding methods of primary mirror with offset hole on its surface wavefront aberration** [13960-38]

13960 0S **TDI line-scan dark-field scattering detection of wafer defects based on hierarchical integration diffusion model** [13960-39]

13960 0T **Ultraprecision fabrication of the Wolter-I mandrel based on the SPDT and wheel polishing technologies** [13960-42]

13960 0U **Single beam 3DoF ultraprecision interferometer based on wave-front interference image** [13960-43]

13960 0V **Bending analysis of size-dependent functionally graded nanobeams** [13960-44]

13960 0W **Precise toroidal mirror metrology using computer-generated hologram in long trace profiler** [13960-45]

13960 0X **Neural network for off-axis four-mirror optical system alignment** [13960-46]

13960 0Y **A fiber-based dispersive displacement sensor for three-degree-of-freedom measurement** [13960-47]

13960 0Z **Automated detection method for aspheric surface** [13960-48]

13960 10 **Hybrid assembly and alignment method for large-aperture space mirrors** [13960-49]

13960 12 **Research on wafer image enhancement based on deep learning** [13960-51]

13960 13 **Design of myopia control lenses based on diffusion optics and progressive addition technologies** [13960-52]

13960 14 **Design of a high-resolution microscopic system for wear measurement based on aspheric Schwarzschild objective** [13960-53]

13960 15 **DeepSeek-assisted elliptical flow-line method for LED freeform surface uniform illumination design** [13960-54]

13960 16 **Energy transfer model and optimization strategies for Fourier ptychographic microscopy** [13960-55]

13960 17 **Research on modular splicing technology of detector** [13960-67]

13960 18 **Design, analysis, and testing of a high-performance UVI** [13960-77]

13960 19 **Vertical axis remote sensing payload installation and adjustment technology** [13960-79]

13960 1A **Research on precision tool setting technology based on in situ optical imaging** [13960-82]

OPTOELECTRONICS TESTING AND MEASUREMENT

13960 1B **Compensation correction for point-like source saturation in calorimeter readout detection** [13960-10]

13960 1C **Design and simulation analysis of an optomechanical probe for precision voltage measurement** [13960-12]

13960 1E **High-precision microring resonator temperature sensing technology based on widely tunable lasers** [13960-17]

13960 1F **Theoretical study on error analysis and compensation of dual vortex retarder Mueller matrix ellipsometry** [13960-20]

13960 1G **High-precision polarization angle measurement via polarization camera and statistical analysis** [13960-21]

13960 1H **Characteristics of wavelength standard system based on two-photon transition in ^{87}Rb atoms** [13960-24]

13960 1I **Research on grayscale gain testing technology for EBCMOS digitalized low-light level devices** [13960-29]

13960 1J **Microlens array position errors analysis and evaluation of Hartmann wavefront sensor calibration systems** [13960-30]

13960 1K **Testing technology for field-of-view defects in EBCMOS devices** [13960-32]