## PROCEEDINGS OF SPIE

# Fourth International Computational Imaging Conference (CITA 2024)

#### Xiaopeng Shao

Editor

20–22 September 2024 Xiamen, China

Organized by

Computational Imaging Committee, CSOE (China)

Xi'an Institute of Optics and Precision Mechanics, Chinese Academy of Sciences (China)

Tsinghua University (China)

Zhejiana University (China)

National Key Laboratory of Electromagnetic Space Security (China)

Nanjing University of Science Technology (China)

Smart Computational Imaging Research Institute of Nanjing University of Science and Technology (China)

Well Vision (China)

LUSTER LightTech Company Ltd. (China)

Beijing MEET YUAN Company Ltd. (China)

PhotoniX (China)

Sponsored by

The Chinese Society of Optical Engineering (China)

Published by

**SPIE** 

**Volume 13542** 

Part One of Two Parts

Proceedings of SPIE 0277-786X, V. 13542

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

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 Fourth International Computational Imaging Conference (CITA 2024), edited by Xiaopeng Shao, Proc. of SPIE 13542, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X

ISSN: 1996-756X (electronic)

ISBN: 9781510688834

ISBN: 9781510688841 (electronic)

Published by

SPIE

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

Copyright © 2025 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

xvii Conference Committee

#### **Part One**

### FOURTH INTERNATIONAL CONFERENCE ON COMPUTATIONAL IMAGING 13542 02 An improved residual network image enhancement method for surface defect reconstruction [13542-1] Detection of rare earth elements in contaminated seawater using laser-induced 13542 03 fluorescence spectroscopy [13542-2] 13542 04 A dual five-element stereo array passive acoustic localization fusion method [13542-3] 13542 05 Employing machine learning paradigms for optimized hard disk failure prediction in shipboard systems [13542-4] 13542 06 Automatic reconstruction of digital hologram of marine suspended particles [13542-5] 13542 07 Research on the construction of underwater acoustic ranging network for marine seismic exploration [13542-6] 13542 08 Research on a compact wavelength selective switch [13542-7] 13542 09 TCN-based end-to-end optimization for IM-DD optical communication system [13542-8] 13542 0A Research on narrow linewidths laser of multicore fiber [13542-9] 13542 OB Study on OAM-basis underwater single-pixel imaging [13542-10] Security evaluation method of quantum key distribution in conjunction with non-quantum 13542 OC cryptography based on wireless communication [13542-11] 13542 0D Research on high-resolution imaging method based on digital holographic microscope [13542-12] 13542 OE Research on lightning strike monitoring of OPGW cable based on FBG array sensing [13542-13] Research and engineering application of inclinometer technology based on distributed 13542 OF fiber optic sensing [13542-14]

13542 OG	Research on fast feature extraction of Brillouin scattering spectrum based on cross-correlation and cutoff frequency [13542-15]
13542 OH	High-capacity and high-density FBG array sensing demodulation system based on high-speed wavelength-swept REC-DFB laser array [13542-16]
13542 01	Multi-DRFM jamming localization method using hybrid TDOA-AOA measurements in distributed array radar [13542-18]
13542 OJ	Fiber-optic probe-based electrochemical sensor for carbonate ions detection [13542-19]
13542 OK	Sidelobe suppression in optical pulse compression reflectometry via mismatched filtering [13542-20]
13542 OL	Computational imaging of kidney tumor using multimodal MRI images [13542-21]
13542 OM	An automated FBG localization algorithm for distributed strain sensing system using weak FBG array [13542-22]
13542 ON	Design of tunable tellurite glass microbubble resonator laser in 2 $\mu$ m band [13542-23]
13542 00	Opto-mechanical resonators for micro-mass sensing [13542-24]
13542 OP	In-advance robust timing/frequency synchronization algorithm based on phase-coded pilot [13542-25]
13542 0Q	Research on passive direction of arrival estimation algorithm of underwater targets based on fiber optic hydrophone array [13542-26]
13542 OR	Detecting deformable mirrors through dynamic phase measuring deflectometry [13542-27]
13542 OS	System-level calibration method of FOG-MEMS accelerometer SINS for unmanned aerial vehicle electro-optical pod $[13542-28]$
13542 OT	Characteristics of forward stimulated Brillouin scattering temperature sensor based on single mode PbS-doped optical fiber [13542-29]
13542 OU	Vibration recognition of UWFBG-array-DAS based on Bayesian optimization random forest [13542-31]
13542 OV	Femtosecond laser drilling in nickel-based superalloy [13542-32]
13542 OW	Frequency band feature extraction analysis of pipeline leakage in fiber optic DAS system $\left[13542\text{-}33\right]$
13542 OX	Deployment of phase sensitive optical time-domain reflectometry for acoustic emission detection of partial discharge in XLPE cables [13542-34]

13542 OY	Research on liquid pipeline blockage based on quasi-distributed FBG [13542-36]
13542 OZ	Research on transient response optimization of fiber optic seismic sensor targeting oil and gas field exploration [13542-39]
13542 10	Confocal non-line-of-sight imaging based on Lissajous scanning [13542-40]
13542 11	Large depth of field Fourier ptychographic microscopy based on energy-oriented adaptive step-size strategy [13542-41]
13542 12	Anti-resonant hollow-core optical fiber as a Fabry-Pérot interferometric high-performance cavity-enhanced photoacoustic sensing [13542-42]
13542 13	An active and passive hybrid mode-locked fiber laser based on a LiNbO $_3$ electro-optic modulator and CNT $[13542\text{-}43]$
13542 14	Development of FBG miniature force sensors for tactile sensing in robot-assisted minimally invasive surgery $[13542\text{-}45]$
13542 15	High signal-to-noise ratio distributed fiber optic sensor based on non-linear frequency modulated signal [13542-46]
13542 16	Research on the concept of antisubmarine warfare based on cooperation and closure control of unmanned equipment $[13542\text{-}48]$
13542 17	Vehicle information monitoring and identification on highway bridges using an array of fiber Bragg grating sensors and deep learning algorithms [13542-49]
13542 18	High-sensitivity of 64-element fiber optic hydrophone system [13542-50]
13542 19	Single-end dislocation welded magnetic field sensor of HCF-VSMF-HCF structure [13542-52]
13542 1A	Maritime 5G system performance evaluation on the Zhujiajian-Dongji ferry route [13542-53]
13542 1B	A broadband double layer graphene modulator based on a hybrid plasma waveguide with a tunable capacitive structure [13542-54]
13542 1C	TransRain: a hybrid deep learning and image registration approach for accurate satellite precipitation estimation with ground-based validation [13542-55]
13542 1D	Applications of surface-to-subsurface unmanned systems in oceanic observation [13542-56]
13542 1E	Propagation of Laguerre-Gaussian beam in turbulent plasma sheaths [13542-57]
13542 1F	Research of metamerism in laser displays [13542-58]

Research and experimental verification of humidity monitoring based on spectral absorption method with optical fiber [13542-59]
Autonomous underwater topographic surveying without tidal observation in network RTK mode and its engineering application [13542-62]
Beam pattern optimization using Pareto-enhanced particle swarm with cross-variance optimization (PPS-CVO) algorithm [13542-63]
Optimization of time-domain differential algorithm to enlarge dynamic strain range of $\Phi\textsc{-OTDR}$ system $[13542\textsc{-}64]$
Quasi-distributed pipeline leakage monitoring based on microfiber resonator [13542-65]
Temperature and humidity field monitoring inside the cables of Shenzhong bridge based on grating arrays [13542-66]
Joint coding of polar code for laser-acoustic underwater communication [13542-68]
High-rate transmedia opto-acoustic communication method based on passive relaying [13542-69]
Research and application of submarine cable protection detection technology based on DAS [13542-70]
Research on optical image quality assessment under strong light interference [13542-71]
Effect of light sources on speckle reduction and color gamut performance in laser display systems [13542-72]
Passive non-line-of-sight imaging via hyperspectral autoencoder Net [13542-74]
BOTDA temperature extraction based on coordinate attention residual network [13542-75]
Standardization recommendations and product design of watertight cables for deep-sea equipment [13542-77]
Numerical research of the electrical wakes generated by propellers [13542-78]
Broadband multilayer absorber based on impedance matching in mid-infrared range [13542-79]
All-dielectric broadband absorber based on multi-structured silicon [13542-80]
Experimental research on characteristics of laser induced underwater acoustic signals [13542-81]

13542 1Y	Fast Brillouin frequency shift estimation using digital elevation modeling method in BOTDR [13542-82]
13542 1Z	Generation of non-smooth spike spectrum in Yb-doped mode-locked fiber laser [13542-83]
13542 20	Point spread function of pulsed laser transmission in multilayer random media [13542-84]
13542 21	Distributed optical fiber acoustic sensing system based on laser pulse coding [13542-85]
13542 22	Calculation of spectral inversion in terawatt broadband chirped-pulse amplification [13542-86]
13542 23	High-precision integral imaging 3D salient object detection and reconstruction [13542-87]
13542 24	Two-photon polymerization 3D printing of full-color imaging micro-lens [13542-88]
13542 25	A high-precision fiber Bragg grating displacement sensor for structural displacement monitoring [13542-89]
13542 26	Prediction of power evolution in second-order Raman systems based on PINN [13542-90]
13542 27	Inorganic chloride vapor doping for high-performance fiber gyroscope light sources [13542-91]
13542 28	Numerical simulation study on thermal trailing wake of targets at sea [13542-92]
13542 29	Experimental research on convergence deformation of engineering structures based on distributed optical fiber sensing technology [13542-93]
13542 2A	A fiber Bragg grating pressure sensor for dynamic pressure monitoring in gas extraction boreholes [13542-94]
13542 2B	Design and fabrication of two-dimensional holographic grating waveguide [13542-95]
13542 2C	Pressure-type ocean wave sensor based on fiber Bragg grating [13542-96]
13542 2D	Trans-reflective polarization beam splitter based on sub-wavelength binary grating [13542-99]
13542 2E	The pixel design of a SPAD-based TOF sensor for 3D imaging [13542-100]
13542 2F	A progressive deep learning network for ptychographic imaging [13542-101]
13542 2C	Tungble topological electric filter [13542-102]

13542 2H	200G simplified coherent PON with bandwidth savings at ONU-end based on digital subcarrier multiplexing [13542-103]
13542 21	Liquid viscosity measurement based on current-modulated single-fiber optical tweezers [13542-104]
13542 2J	Distributed fiber optic hydrophone based on backscattering-enhanced DAS [13542-105]
13542 2K	General model of coarse pointing mechanism actuator for satellite optical communication based on voice coil motor [13542-106]
13542 2L	Longitudinal monitoring of polarization mode dispersion for long-haul fiber optic links based on deep learning $[13542\text{-}107]$
13542 2M	An iterative local correlation tracking method for high-accuracy wavefront sensing [13542-108]
13542 2N	Experimental verification of chirp models in intensity-modulation with direct-detection system in short-range optical data center interconnects [13542-111]
13542 20	Pipeline leakage location method based on 1DLKNet and spectrum weighting [13542-114]
13542 2P	Deformation monitoring of aircraft wings based on FBG technology [13542-115]
13542 2Q	Application of optical fiber monitoring outside casing of horizontal well in unconventional reservoir: a typical case study [13542-117]
13542 2R	Simultaneous quantum and classical communication protocol via orthogonal polarization multiplexing [13542-118]
13542 2S	Cross-medium multi-carrier communication method based on millimeter-wave radar [13542-119]
13542 2T	Experimental study of strain in retired fiber optic cables based on Brillouin sensing [13542-120]
13542 2U	Research on anti-jamming technology of weak target on sea surface based on infrared polarization imaging [13542-121]
13542 2V	Infrared image optical machine thermal radiation noise removal based on surface fitting [13542-122]
13542 2W	Research on the higher-order mode characteristics of S-band in G.654.E fiber [13542-123]
13542 2X	Joint sensing and communication on fiber system with integrated waveform designing [13542-124]
13542 2Y	Design of rotary cryocoolers drive control system based on FPGA [13542-125]

13542 2Z	Demodulation method for optical fiber flow velocity sensor based on reference filter [13542-126]
13542 30	A dual-agent deep-reinforcement-learning method for hybrid scheduling of instantaneous and delay-tolerant requests in elastic optical networks [13542-127]
Part Two	
13542 31	Pulse position coding method for cross-medium communication based on laser-induced acoustics [13542-128]
13542 32	Sensitivity enhanced D-shaped photonic crystal fiber SPR sensor with Ag/WoS $_2$ film $[13542\text{-}129]$
13542 33	Effect to JCT optical image encryption and system decryption by experimental parameters [13542-130]
13542 34	Fiber optic magnetic field and temperature sensor [13542-131]
13542 35	A regulated cascode transimpedance amplifier for LiDAR receiver [13542-132]
13542 36	Research on differential pressure measurement technology of nuclear power plant based on optical fiber Fabry-Perot sensing [13542-133]
13542 37	Evaluation method for underwater polarization image quality applied to laser polarization illumination conditions [13542-134]
13542 38	A robust method for fiber-longitudinal power profile estimation based on the pre-rotation of constellations [13542-135]
13542 39	Light source attacks on CMOS-based QRNGs [13542-136]
13542 3A	Gradient-index curved acoustic lenses for high-precision imaging [13542-137]
13542 3B	Study and analysis of optical frequency comb based on Mach-Zehnder intensity modulator [13542-138]
13542 3C	Imaging for moving target through scattering media based on speckle correlation [13542-140]
13542 3D	Prediction of short-time overload capability for submarine cable based on distributed optical fiber temperature sensing [13542-141]
13542 3E	Axle counting sensor system based on FBG for suspended permanent magnet maglev rail transit [13542-143]
13542 3F	A transformer-based ground penetrating radar target detection model [13542-144]

13542 3G	Detection of kanamycin using a triplex molecular switch based on nucleic acid aptamer [13542-145]
13542 3H	A personalized glucose prediction model based on deep long short-term memory networks [13542-146]
13542 31	Design of focused light field imaging optical system based on microlensing arrays [13542-147]
13542 3J	Design of liquid refractive index sensor with Fabry-Perot resonant cavity based on laser frequency modulation continuous wave technology [13542-148]
13542 3K	High-bandwidth control technology for deformable mirrors to suppress complex frequency aberrations [13542-149]
13542 3L	Influence of fiber coupling on output performance in photodetector packaging [13542-150]
13542 3M	Imaging through scattering media via optronic convolutional neural network [13542-151]
13542 3N	Edge breakdown suppression in InGaAs/InP avalanche photodiodes with negative bevel angle using P-type edge-field buffer layer [13542-152]
13542 30	Study of denoising methods for water surface vibration signals using empirical mode decomposition [13542-155]
13542 3P	Pulse state switchable erbium-doped mode-locked fiber laser based on graphene saturable absorber [13542-156]
13542 3Q	Secure encryption system based on quantum access network [13542-157]
13542 3R	A polarization-independent and broadband achromatic gallium nitride metalens based on extended depth of focus [13542-159]
13542 3S	A novel polar codes construction method for OFDM hydroacoustic communication system under t-distribution noise [13542-160]
13542 3T	Dynamic spectrum allocation with service priority in C+L-band elastic optical networks [13542-161]
13542 3U	Bend-induced polarization-dependent loss in single mode fiber and its impact on nonlinear polarization evolution [13542-162]
13542 3V	Optimizing epipolar constraint matching for fisheye cameras using baseline latitude-longitude technique [13542-163]
13542 3W	IHILLM-RAG: a safe and private medical large language model based on intelligent hardware interaction and retrieval-augmented generation (RAG) [13542-164]
13542 3X	Design of modular autonomous underwater vehicle for swarm applications [13542-165]

13542 3Y	Spaceborne erbium-doped fiber laser transmitter for lidar detection and laser communication [13542-166]
13542 3Z	Key capabilities and network deployments of fine grain OTN [13542-168]
13542 40	Key technologies for low power consumption in submarine optical network [13542-169]
13542 41	Lensless polarization imaging system based on a random coded mask [13542-170]
13542 42	Femtosecond laser drilling in nickel-based alloy assisted by ultrasonic vibration [13542-171]
13542 43	Dynamic adjustment of cross-layer links strategy for uneven service distribution in multilayer optical satellite networks [13542-172]
13542 44	A dual-model approach for detecting unknown adversarial examples using mixed knowledge distillation [13542-173]
13542 45	Research on the comprehensive phase coding tactics and algorithms for LCoS employed in wavelength selective switch $[13542\text{-}174]$
13542 46	A multi-view 3D measurement method based on Scheimpflug optical projection [13542-175]
13542 47	Research on the application of space division multiplexing (SDM) technology in submarine cable system $[13542\text{-}176]$
13542 48	Design and fabrication of metasurface optical elements (MOE) for direct time of flight application [13542-177]
13542 49	A classification algorithm of polarization spectral information of space debris based on Siamese network-K nearest neighbor nonlinear metric learning [13542-178]
13542 4A	Research on UAV night object detection based on parallel fusion neural network [13542-179]
13542 4B	Orthogonal phase-locked amplification for frequency modulated continuous wave laser interferometry displacement measurement [13542-180]
13542 4C	Reflective refractive index sensor based on thinned seven-core fiber with its end coated with gold film [13542-185]
13542 4D	False alarm suppression for a distributed acoustic sensing system utilizing polarization-time division hybrid multiplexing [13542-186]
13542 4E	Characteristics of Doppler shift induced crosstalk in an uwDAS system [13542-188]
13542 4F	3D printed fiber-tip micro-ring resonators for ultrasound sensing [13542-189]

13542 4G	Vertical collision risk study of unmanned aerial vehicles at general aviation airports [13542-191]
13542 4H	Method for simultaneous detection and correction concentration of methane and ethane based on tunable diode laser absorption spectroscopy [13542-192]
13542 41	Fast spatial frequency shift super resolution microscopy based on ring-shot illumination [13542-194]
13542 4J	3D morphology detection technology for the surface with weak texture and small curvature [13542-195]
13542 4K	Rapid shape reconstruction method for surface with large curvature structure based on focal plane detection technology [13542-196]
13542 4L	Research on the three-dimensional measurement system for large-sized and multi-reflective surface components [13542-198]
13542 4M	Phase retrieval system based on refractive index change [13542-199]
13542 4N	Real-time detection of disturbance events in distributed optical fiber sensing using YOLOv9 [13542-200]
13542 40	Ultra-broadband metamaterial absorption in Cr/SiO $_2$ /Ge/Cr-based quadrilayer structure from visible to near infrared [13542-201]
13542 4P	Detection of aircraft taxiing on airport runway based on ultra-weak FBG array [13542-202]
13542 4Q	Brillouin gain spectra super-resolution reconstruction based on learnable interpolation [13542-203]
13542 4R	Few-shot $\Phi$ -OTDR event identification based on attention prototypical network [13542-204]
13542 4\$	<b>250-km ultralong distance single-end <math>\Phi</math>-OTDR assisted by DRA and RPOA technology</b> [13542-205]
13542 4T	High-spatial resolution temperature field reconstruction of thermal protection material using OFDR integrated with all-grating fiber [13542-206]
13542 4U	Using an optical fiber passive depolarizer to suppress the polarization dependence of stimulated Raman scattering gain in hydrogen sensor system [13542-207]
13542 4V	Research on fiber optic gyroscope impact error suppression method [13542-208]
13542 4W	Torsion sensor based on the modal interference pattern of helical side-hole fiber [13542-210]
13542 4X	Study on speckle-free imaging by random laser using <i>Enteromorpha</i> prolifera in a microtubule [13542-211]

13542 4Y	Brillouin frequency shift extraction for BOTDA based on Gramian angular fields [13542-212]
13542 4Z	Monocular camera-based human body orientation measurement system [13542-214]
13542 50	High-quality holography with progressive learning and wrapped phase activation [13542-216]
13542 51	Pluggable compensation module for twofold propagation-based hologram generation [13542-217]
13542 52	Suppression of interference fading in $\phi\text{-OTDR}$ based on spectrum extraction and phase-shift transform $[13542\text{-}218]$
13542 53	The effect of Gamma radiation exposure on silicon photonic devices [13542-220]
13542 54	Simulation and experimental research on top-hat shaped femtosecond laser processing of GaN [13542-222]
13542 55	Improve the negative effects of unknown disturbance on the event recognition for Phi-OTDR [13542-223]
13542 56	Sensitivity enhancement and Faraday effect compensation in dual-polarization fiber optic rotational seismometer [13542-224]
13542 57	High aspect ratio transmission grating for CO <sub>2</sub> detection [13542-226]
13542 58	Study on transmission gratings for wavelength division multiplexing [13542-227]
13542 59	Study on immersive transmission gratings for O <sub>2</sub> A band detection [13542-228]
13542 5A	Structured illumination microscopy using DMD based on high-modulation coefficient mapping-enabled illumination parameter calibration and principal component analysis [13542-229]
13542 5B	Accurate tea bud detection via lightweight object detection and hardware acceleration using FPGA [13542-230]
13542 5C	High-speed interrogation for dynamic fiber Bragg grating sensing [13542-232]
13542 5D	High-speed FBG interrogator based on arrayed waveguide grating [13542-233]
13542 5E	A DIY C-T spectrometer and its application in FBG temperature sensing demodulation [13542-234]
13542 5F	Multi-functional Fresnel zone aperture camera via fast passive depth estimation [13542-235]

13542 5G	Optimizing phase parameterization with dynamic pupil size in multi-frame blind deconvolution [13542-236]
13542 5H	Virtual viewpoint reconstruction utilizing monocular images with complex backgrounds [13542-238]
13542 51	The design of heterogeneous satellite constellation network architecture for dynamic observation tasks [13542-239]
13542 5J	Research on the acceleration methods of multi-frame blind deconvolution based on OpenMP $[13542-241]$
13542 5K	Design method for efficiently recording freeform holographic optical elements [13542-242]
13542 5L	A frequency calculation and temperature compensation system for quartz resonant accelerometer sensors [13542-243]
13542 5M	Research on the application of airport security target detection algorithm under the background of low-altitude economy [13542-244]
13542 5N	Design of optomechanical ultrasound sensor based on Si and SiN composite waveguide [13542-246]
13542 50	Selective ablation of Cu-coated PEEK using femtosecond lasers [13542-247]
13542 5P	The research of distributed CO <sub>2</sub> monitoring technology based on NB-IoT [13542-248]
13542 5Q	Experimental studies on computational ghost imaging [13542-249]
13542 5R	Temporal multiplexing coding strategy for spatiotemporal compressed imaging [13542-250]
13542 5\$	Research on digital simulation of space camera imaging chain based on static MTF mathematical model [13542-253]
13542 5T	Study on relaxation characteristics of a miniaturized $^3$ He magnetometer based on spin-exchange optical pumping technology $[13542-254]$
13542 5U	The causes of baking precipitates in microchannel plates and the preparation technology [13542-255]
13542 5V	Optimizing object classification with single-pixel imaging and transformer networks [13542-257]
13542 5W	Fourier ptychographic microscopy for algae: quantitiative phase imaging and analysis of biological characteristics [13542-260]
13542 5X	The measurement of large-aperture freeform surface based on sub-aperture stitching phase measuring deflectometry [13542-262]

13542 5Y	Research on the high magnetic field and current measurement system based on <sup>3</sup> He nuclear magnetic resonance [13542-263]
13542 5Z	Nanometer-scale wafer surface defect measurement based on state-space digital holographic microscopy [13542-264]
13542 60	Cycle-GAN-based holographic reconstruction for 3D particle fields [13542-265]
13542 61	Silicon optical filter with flat passband and high roll-off rate for fine spectrum processing [13542-268]
13542 62	The influence of preparation technology on coupling characteristics of micro-nano optical fiber devices [13542-273]