PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 11763

, "Front Matter: Volume 11763," Proc. SPIE 11763, Seventh Symposium on Novel Photoelectronic Detection Technology and Applications, 1176301 (12 March 2021); doi: 10.1117/12.2592610

SPIE.

Event: Seventh Symposium on Novel Photoelectronic Detection Technology and Application 2020, 2020, Kunming, China

PROCEEDINGS OF SPIE

Seventh Symposium on Novel Photoelectronic Detection Technology and Applications

Junhong Su
Junhao Chu
Qifeng Yu
Huilin Jiang
Editors

5–7 November 2020
Kunming, China

Sponsored by
Chinese Society for Optical Engineering (CSOE) (China)
Science and Technology on Low-light-level Night Vision Laboratory (China)

Organized by
Yunnan University (China)
Xi'an Technological University (China)

Published by
SPIE

Volume 11763

Part One of Four Parts

Proceedings of SPIE 0277-786X, V. 11763

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

Seventh Symposium on Novel Photoelectronic Detection Technology and Applications, edited by
Junhong Su, Junhao Chu, Qifeng Yu, Huilin Jiang, Proc. of SPIE Vol. 11763, 1176301
© 2021 SPIE · CCC code: 0277-786X/21/\$21 · doi: 10.1117/12.2592610

Proc. of SPIE Vol. 11763 1176301-1

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 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 *Seventh Symposium on Novel Photoelectronic Detection Technology and Applications*, edited by Junhong Su, Junhao Chu, Qifeng Yu, Huilin Jiang, Proceedings of SPIE Vol. 11763 (SPIE, Bellingham, WA, 2021) Seven-digit Article CID Number.

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

ISBN: 9781510643611
ISBN: 9781510643628 (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 © 2021, 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 \$21.00 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/21/\$21.00.

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: *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

Part One

NOVEL PHOTOELECTRONIC DETECTION TECHNOLOGY AND APPLICATIONS

- 11763 02 **Moving target detection for three-channel SAR based on adaptive phase center offset antenna technology [11763-4]**
- 11763 03 **Amplitude and phase test system in outfield for T/R modules on active phased array radar [11763-5]**
- 11763 04 **Research on precision measurement and assembly technology of Fery prism [11763-6]**
- 11763 05 **Research on light intensity distribution of end-pumped 1064nm Q-switched laser [11763-7]**
- 11763 06 **Lattice phenomenon and mechanism analysis of CMOS image sensor irradiated by 532 nm laser [11763-9]**
- 11763 07 **Research on hybrid TDI accumulation technology base on image registration [11763-11]**
- 11763 08 **Research on anti-SEU strategy for remote sensing camera based on SRAM-FPGA [11763-12]**
- 11763 09 **A comparison of models for correcting astronomical atmospheric refraction [11763-13]**
- 11763 0A **Extending the near-infrared response of a VOPc-based organic photodetector by depositing VOPc on a p-6P modified ITO substrate [11763-14]**
- 11763 0B **Optimal ordering strategy of Hadamard measurement basis for single-pixel imaging [11763-15]**
- 11763 0C **Analysis and correction of the image motion for the rolling shutter CMOS detector [11763-16]**
- 11763 0D **Radiometric calibration method of MWIR spectrometer coded by Hadamard transform [11763-17]**
- 11763 0E **Cotton quality intelligent classification-based image-fusion vision inspection [11763-20]**
- 11763 0F **Molecular beam epitaxial InSb infrared photodiode with low dark current [11763-21]**
- 11763 0G **Based on infrared laser Imaging research on foreign objects detection between subway door [11763-22]**
- 11763 0H **Remote sensing interpretation of Erennaer Sag and research on metallogenesis of sandstone-type uranium deposit [11763-23]**

11763 OI	Measurement of complex refractive index of graphene in infrared bands by reflection spectra [11763-24]
11763 OJ	Quick searching method for common edges [11763-25]
11763 OK	AA Tau polarimetric observation using Kanata HONIR instrument [11763-26]
11763 OL	Research on obtaining temperature by using the relative intensity of the hydroxyl radical spectrum in the ultraviolet band [11763-27]
11763 OM	The readout system design of 320x256 InGaAs astronomical camera [11763-29]
11763 ON	Temperature sensor based on light scattering measurement of microcavity-coupled nanoparticles [11763-30]
11763 OO	Towards dual-band shot-wave and mid-wave infrared focal plane array by using colloidal quantum dots [11763-31]
11763 OP	PON-based bus-type optical fiber data bus [11763-33]
11763 OQ	Optical element fabrication for anti-sniper laser detection [11763-34]
11763 OR	Review of reliability research on infrared detector [11763-35]
11763 OS	Microwave signal generation based on the optoelectronic oscillator with a dual-long-loop configuration [11763-36]
11763 OT	Experimental study on single photon heterodyne detection performance [11763-37]
11763 OU	Orbital angular momentum transmission characteristics in atmospheric turbulence [11763-39]
11763 OV	Simulation study of detection system on LED stimulated plant chlorophyll fluorescence [11763-40]
11763 OW	Measurement of fireball characteristic based on high-speed photography [11763-41]
11763 OX	Terahertz wavefront manipulation in graphene metalens for dual polarization incidences [11763-42]
11763 OY	Research on optimal skip connection scale in learning-based scattering imaging [11763-43]
11763 OZ	Polarization imaging detection method based on dynamic vision sensor [11763-45]
11763 IO	Research on point cloud data processing for helicopter aided navigation [11763-47]
11763 II	Application of fuzzy active disturbance rejection control in stable imaging [11763-49]

- 11763 12 **Remote sensing of the aquatic environment by semiconductor laser-induced fluorescence lidar** [11763-50]
- 11763 13 **Research on fast cloud detection based on FPGA** [11763-51]
- 11763 14 **Point target detection methods based on multi-frame association** [11763-52]
- 11763 15 **Column nonuniformity analysis of digital ROIC for infrared focal plane array** [11763-54]
- 11763 16 **Research on aerodynamic performance of parafoil for autonomous recovery** [11763-55]
- 11763 17 **Infrared radiation target characteristics of six rotors UAV** [11763-56]
- 11763 18 **Design and simulation of InGaAs/InP avalanche photodiode for single photon detection** [11763-57]
- 11763 19 **Camera model and image rectification method for imaging through water-air Snell's window from underwater** [11763-59]
- 11763 1A **768×576 bit interline transfer EMCCD sensor** [11763-60]
- 11763 1B **Research on alteration information extraction based on GF-5 VIMS** [11763-61]
- 11763 1C **A design of tracking system with multiple tracking methods deployed on Hisilicon platform** [11763-62]
- 11763 1D **Design of ultraviolet optical system based on AlGaIn solar blind ultraviolet image intensifier** [11763-63]
- 11763 1E **Long-range coherent lidar based on pulse-compression** [11763-64]
- 11763 1F **Variable step length method for optical adjustment in space-borne lidar** [11763-65]
- 11763 1G **Urban river water quality monitoring with unmanned plane hyperspectral remote sensing data** [11763-67]
- 11763 1H **Facial expression recognition using switch instance-batch normalization** [11763-68]
- 11763 1I **4.05kW monolithic narrow line-width near diffraction-limited fiber laser** [11763-69]
- 11763 1J **Design of a high-performance EMCCD imaging system** [11763-70]
- 11763 1K **Large array EMCCD driving circuit design** [11763-71]
- 11763 1L **A novel infrared target detection and tracking method** [11763-72]
- 11763 1M **Airborne actively Q-switched quasi-continuous-wave all-solid-state laser** [11763-73]

- 11763 1N **Detection of surface defects and dimensions of graphite seal ring based on machine vision** [11763-74]
- 11763 1O **Advances and marine applications of optical neural network** [11763-75]
- 11763 1P **Free-form objective for three generation image intensifier** [11763-76]
- 11763 1Q **Fabrication of spectral differential four channel microfiltration array** [11763-77]
- 11763 1R **Testing the space optical telescope optical system with modified phase retrieval technology** [11763-78]
- 11763 1S **Single-photon imaging detection technology** [11763-79]
- 11763 1T **A summary of research progress of single image to remove rain and fog based on deep learning** [11763-80]
- 11763 1U **The influence of coding template elements rounded error on the spectrum in compressed sampling hyperspectral imaging** [11763-81]
- 11763 1V **Intelligent ship detection method based on spatial-spectrum features** [11763-82]
- 11763 1W **Research on improving imaging field of view of laser imaging through scattering media** [11763-83]
- 11763 1X **Hyperspectral and multispectral remote sensing of aerosols based on surface spectral reconstruction by PCA** [11763-84]
- 11763 1Y **The effort of finding p-type β -Ga₂O₃:a review of theoretical and experimental research** [11763-85]
- 11763 1Z **Fabrication of 64×64 InGaAs/InP avalanche photodiode (APD) focal plane arrays** [11763-86]
- 11763 20 **A fast recognition algorithm for dimension decreased extraction of space non-cooperative target** [11763-87]
- 11763 21 **Research on flow and infrared radiation characteristics unsteady plume in atmospheric environment** [11763-89]
- 11763 22 **Depth feature extraction for mineral mixed spectrum analysis based hyperspectral data** [11763-90]
- 11763 23 **Radiometric calibration of low light imager based on specialized light sources** [11763-91]
- 11763 24 **Measurement of orbital angular momentum** [11763-93]
- 11763 25 **Single photo detector epitaxial design and optimization** [11763-94]

11763 26	Design of space visible high dynamic camera [11763-95]
11763 27	Spectral radiation characteristics of high temperature gas in low altitude environment [11763-96]
11763 28	Adaptive infrared medium and long wave image fusion method based on color transfer algorithm [11763-97]
11763 29	Application of photoelectric measurement technology in volume measurement of large LNG vertical storage tank [11763-99]
11763 2A	Research on missile avoidance decision training based on improved DDPG algorithm [11763-101]
11763 2B	Compressive circular polarization imaging spectrometry [11763-102]
11763 2C	Mid-wave infrared spatial heterodyne interference imaging spectrometer [11763-103]
11763 2D	Applications and analyses of laser detection technology in the laser guided bomb [11763-104]
11763 2E	A single-photon lidar ranging accuracy evaluation model [11763-105]
11763 2F	Pre-emphasis based Fourier phase shifting ghost imaging [11763-106]
11763 2G	Research on improving reconstruction quality from holograms of marine algae in digital holographic microscopy [11763-107]
11763 2H	Efficient and noise robust photon-counting imaging method [11763-108]
11763 2I	A comparison of methods in feature extraction for the classification of algae [11763-109]
11763 2J	Identification of true or false blood based on photoacoustic spectroscopy combined with LDA-iPLS algorithm [11763-110]
11763 2K	An infrared scanning temperature measurement system based on wireless transmission [11763-111]
11763 2L	Design and implementation of image sample management database [11763-113]
11763 2M	Research on anti-occlusion and anti-deformation tracking based on background prediction and progressive detection [11763-114]
11763 2N	3D imaging model of airborne LiDAR system [11763-116]
11763 2O	Guidance law based on zero effort miss and Q-learning algorithm [11763-117]
11763 2P	Non-uniformity correction algorithm based on improved neural network [11763-118]

Part Two

- 11763 2Q **Topology simulation method of rotor UAV motion [11763-119]**
- 11763 2R **Experimental investigations on the spray macroscopic and microscopic characteristics in supersonic crossflows [11763-120]**
- 11763 2S **Three-dimensional unwrapping algorithm based on reliability sorting following a path with added threshold [11763-122]**
- 11763 2T **FPGA-based research on high frame rate infrared image real-time acquisition and processing system [11763-123]**
- 11763 2U **Design of compression-sensing projection measurement optical system based on digital micromirror device for spectral imaging [11763-124]**
- 11763 2V **Improved global optimal association algorithm for ships track [11763-125]**
- 11763 2W **Research on phased array radar wave position scanning method and intercept probability [11763-126]**
- 11763 2X **Engineering application of ZM5600 high precision optical imaging quality testing environment simulator [11763-127]**
- 11763 2Y **Stable imaging of space optical camera with high resolution and large field of view [11763-128]**
- 11763 2Z **A new method of data fusion for MEMS gyroscope [11763-129]**
- 11763 30 **The generation of Watt-level supercontinuum covering 2-6.5 μm in an all-fiber structured infrared nonlinear transmission system [11763-130]**
- 11763 31 **Evaluation criteria for computational spectral imaging quality [11763-131]**
- 11763 32 **A review of non-maximum suppression algorithms for deep learning target detection [11763-133]**
- 11763 33 **Research on behavior modeling of CGF based on agent [11763-134]**
- 11763 34 **Optical design of a snapshot hyperspectral imaging spectrometer for facial colour diagnosis in traditional Chinese medicine [11763-135]**
- 11763 35 **Research on large-scale plane coordinate measurement technology based on multi-axis synchronous laser interferometry [11763-136]**
- 11763 36 **Design of optical-mechanical system of compact space infrared camera [11763-137]**
- 11763 37 **Design of LPV sliding mode controller for hypersonic vehicle based on the upper bound of uncertainty [11763-138]**

- 11763 38 **The analysis of the style of U.S. military cloud operation with the fifth generation fighter as its core** [11763-139]
- 11763 39 **Analysis of infrared limb atmospheric transmittance based on atmospheric profile observed by satellite** [11763-140]
- 11763 3A **Spectral imaging microscopic system with long working distance for burn diagnosis** [11763-142]
- 11763 3B **Fiber-laser-pumped green laser for photon-counting bathymetric Lidar on UAV platform** [11763-143]
- 11763 3C **Retrieval of high temporal sea surface current from geostationary satellite images** [11763-144]
- 11763 3D **Cs adsorption on β -Ga₂O₃ (100) surface: a first-principles research** [11763-145]
- 11763 3E **Experimental realization of underwater optical communication based on single photon detector** [11763-146]
- 11763 3F **Real-time HD electronic image stabilization system based on heterogeneous computing** [11763-147]
- 11763 3G **Evaluation of compression quality of space-borne interference hyperspectral image** [11763-148]
- 11763 3H **A novel multicore fiber temperature sensor based on Fabry-Perot structure** [11763-150]
- 11763 3I **Measurement and characterization of ultra-thin gaps in cylindrical assembling parts** [11763-151]
- 11763 3J **Theoretical study of beam quality degradation caused by grating dispersion in a spectral beam combining system** [11763-152]
- 11763 3K **Photonic generation of microwave hybrid frequency/phase shift keying signals based on a parallel structure** [11763-153]
- 11763 3L **Matrix rearrangement for ISAR echo completion with undersampled data** [11763-155]
- 11763 3M **Application and effect analysis of high power laser atmospheric transmission** [11763-156]
- 11763 3N **Detection probability of elliptical Gaussian optical in turbulent atmosphere** [11763-157]
- 11763 3O **Design of an optical Toffoli gate for reversible logic operation using silicon photonic integrated circuits** [11763-158]
- 11763 3P **Underwater image restoration based on improved dark channel prior** [11763-159]
- 11763 3Q **Analysis of current clamp injection method in conducted immunity tests** [11763-160]

11763 3R	Integrated design of guidance and control system considering body line-of-sight angle and input constraints [11763-161]
11763 3S	Using background model and shallow convolutional neural network to detect moving vehicles from satellite videos [11763-164]
11763 3T	Traveling wave electrode simulation for integrated lithium niobite electro-optic modulators [11763-165]
11763 3U	Comparative study on three reconstruction algorithms for a single pixel hyperspectrometer [11763-167]
11763 3V	Constrained reentry trajectory optimization based on improved particle swarm optimization algorithm [11763-168]
11763 3W	Integrated channel-shared optical true time delay line array based on grating-assisted contradirectional couplers for phased array antennas [11763-169]
11763 3X	Leakage gas enhancement for infrared dual-band spectral differential imaging [11763-170]
11763 3Y	Observation confidence based satellite hyperspectral quantitative fusion scheme [11763-171]
11763 3Z	Research on method of fast calibration for mobile TT and C equipment [11763-173]
11763 40	Research status of dark current in CMOS image sensor [11763-174]
11763 41	A lightweight real-time infrared image instance segmentation algorithm based on tiny YOLO [11763-175]
11763 42	High performance waveguide-integrated germanium photodetectors [11763-176]
11763 43	Research on correlation of infrared image quality evaluation indexes for target tracking [11763-177]
11763 44	Analysis of ultraviolet spectral parameters of NO molecules in the shock layer of RAM-CII hypersonic vehicle [11763-178]
11763 45	Research on key technologies of underwater target detection [11763-179]
11763 46	Research on the influence of local image denoising algorithm on photon-noise transfer method [11763-180]
11763 47	Elimination of CMOS fixed pattern noise based on PCA wavelet transform [11763-181]
11763 48	Choosing the quantization bits and quantization method of synthetic aperture radar image [11763-182]
11763 49	Non-line-of-sight transient imaging via using time-of-flight camera [11763-184]

- 11763 4A **Design of 128×32 GM-APD array ROIC with multi-echo detection for single photon 3D LiDAR**
[11763-185]
- 11763 4B **Calculation and fitting of responsivity and quantum efficiency based on HgCdTe detector at wide band** [11763-186]
- 11763 4C **Method for generation and long-distance transmission of millimeter-wave signal based on optical heterodyne technology** [11763-188]
- 11763 4D **Frequency analysis of dynamic laser speckle based on intensity fluctuation modulation**
[11763-189]
- 11763 4E **Fault diagnosis method of satellite attitude control system based on stacked autoencoder network** [11763-190]
- 11763 4F **2 μm band pulsed all-PM thulium-doped fiber laser based on the acousto-optic Q-switching**
[11763-191]
- 11763 4G **Research on geometric error correction of pushbroom hyperspectral camera carried by UAV**
[11763-192]
- 11763 4H **A lightweight network for infrared small target detection based on spatial-temporal associated data** [11763-193]
- 11763 4I **Study on returned signal spatial distribution and detection ability of laser bathymetric system**
[11763-194]
- 11763 4J **Simulation analysis of random mode suppression using two-cavity FBG-FP in random Bragg grating array** [11763-195]
- 11763 4K **Implementation of post-processing for phase-polarization combined modulation QKD system**
[11763-196]
- 11763 4L **Design of near-ultraviolet narrowband filters in multispectral imaging system** [11763-198]
- 11763 4M **Hyperspectral monitoring of wheat stripe rust based on PSO-KELM model** [11763-199]
- 11763 4N **A resource allocation algorithm based on GEO/LEO hierarchical clustering network** [11763-200]
- 11763 4O **Light polarization imaging recovery technique in marine fish observations** [11763-201]
- 11763 4P **Enhanced anchored neighborhood regression for image super resolution based on maximized utilization on dictionary atoms and training sample patches** [11763-202]
- 11763 4Q **Stability of transmission-mode GaAs photocathodes in an ultrahigh vacuum system** [11763-203]
- 11763 4R **Adaptive method of ship tracking window based on improved mean-shift algorithm**
[11763-205]
- 11763 4S **Test and analysis of axial compression stability of composite thin-walled reinforced structures**
[11763-206]

11763 4T	Study on effect of different temperatures on imaging performance of EBAPS devices [11763-207]
11763 4U	Research on analysis and suppression method of scene inhomogeneity of spaceborne imaging spectrometer [11763-208]
11763 4V	Fabrication of a single polarization fiber using pit-in-jacket method [11763-209]
11763 4W	3D spectral data cube modulation for snapshot spectral imaging based on linear encoding of intrinsic chromatic aberration [11763-210]
11763 4X	Infrared and small target detection based on convolution neural network under the ground-air background [11763-211]
11763 4Y	Influence of spatial orientation on depolarization ratio to superellipsoid particles [11763-213]
11763 4Z	A 0.97-W passively Q-switched Tm:YAP laser with a WSe₂ saturable absorber [11763-214]
11763 50	Influence of inner and outer scales on beam wander under strong fluctuation condition [11763-215]
11763 51	Dense feature pyramid fusion deep network for building segmentation in remote sensing image [11763-219]
11763 52	Application of hyperspectral images in digital record of drill cores [11763-220]
11763 53	ZY-3 block adjustment and DSM elevation accuracy evaluation supported by ICESat/GLAS laser points [11763-221]
11763 54	The effect of oceanic turbulence on optical receiving systems [11763-222]
11763 55	High-frequency interferometric optical fiber hydrophone based on acoustic resonance isolation [11763-223]
11763 56	Photonic generation of bandwidth-doubling dual-chirp waveform using a dual-parallel MZM [11763-225]
11763 57	Demonstrating a low-frequency-band microwave photonic radar with large bandwidth [11763-228]
11763 58	Narrow linewidth Yb-Raman fiber amplifier pumped by a random fiber laser [11763-229]
11763 59	Laser frequency sweep linearization by BP neural network for FMCW LiDAR [11763-230]
11763 5A	An infrared data cycle extraction method based on CEEMDAN [11763-231]
11763 5B	Infrared image recognition method for pedestrian and vehicles based on improved YOLO [11763-232]

11763 5C **Diode-pumped Tm:YAG mode-locking laser based on a MoS₂ saturable absorber [11763-233]**

Part Three

11763 5D **RC hybrid SAR ADC with unary capacitor array for IRFPA [11763-234]**

11763 5E **A two-step ADC architecture for dual band IRFPA [11763-235]**

11763 5F **The study of the non-linear dynamic response for circular plate subjected underwater impulsive loading [11763-237]**

11763 5G **Research on irradiance calibration in aging tests [11763-238]**

11763 5H **Sea water refractive index measurement based on v-shaped cavity [11763-239]**

11763 5I **High performance refractive index sensor based on multi-Fano resonances in waveguide coupled cross-shaped resonator [11763-240]**

11763 5J **Comparison of GaoFen-5 hyperspectral and airborne hyperspectral imagery: case study of Gossan identification in Subei area [11763-241]**

11763 5K **Adaptive two-stage Kalman filter for x-ray pulsar navigation [11763-242]**

11763 5L **A higher amplitude all solid state pulse source based on the power synthesis circuit [11763-243]**

11763 5M **Research on the mission oriented mobile model of aviation network [11763-244]**

11763 5N **Failure analysis method for laser initiated device based on Michelson interference [11763-245]**

11763 5O **Design and implementation of CMOS-based low-light level night-vision imaging system [11763-248]**

11763 5P **Analysis of seismic controlling factors of the Danjiangkou reservoir based on remote sensing and aeromagnetic data [11763-249]**

11763 5Q **Analysis of factors affecting of coupling efficiency of the SPIDER [11763-251]**

11763 5R **Measurement of angular displacement by compact mechanical structure based on laser interference system [11763-252]**

11763 5S **Mid-infrared supercontinuum generation in chalcogenide photonic crystal fibers: a brief review [11763-253]**

11763 5T **Measurement of rotational speed and eccentric distance of non-cooperative object using vortex beam [11763-254]**

11763 5U **Research on the technique of optical fiber bolt axial stress measurement [11763-256]**

- 11763 5V **Image quality evaluation method for compressed satellite remote sensing images with high quantization bits** [11763-257]
- 11763 5W **River extraction of color remote sensing image based on HSV and shape detection** [11763-258]
- 11763 5X **Analysis of cryocooler jitter on three-mirror-anastigmat camera imaging** [11763-259]
- 11763 5Y **An image defogging method using adaptive Bi-channel priors** [11763-260]
- 11763 5Z **Objective location method of tropical cyclone by the deviation angle variance with pre-processing** [11763-263]
- 11763 60 **An optical power ratio based approach to direction of arrival estimation of microwave signals with high dynamic frequency range** [11763-264]
- 11763 61 **An improved PMDI-TDM structure for remotely interrogated optical fiber hydrophone arrays** [11763-265]
- 11763 62 **WF_DiMP: weight-aware dual-modal feature aggregation mechanism for RGB-T tracking** [11763-267]
- 11763 63 **Design of optical system for short-wave infrared silicon immersion grating imaging spectrometer** [11763-268]
- 11763 64 **Research on polarization detection technology of oil spill on sea surface** [11763-269]
- 11763 65 **Impact of time error on two newly proposed carrier assisted differential detection receivers** [11763-270]
- 11763 66 **Hardware architecture design of data exchange equipment based on CPO** [11763-271]
- 11763 67 **Multi-spectrum integrated and multi-module splicing TDI line array infrared detector technology** [11763-272]
- 11763 68 **A method for calculating the energy focus ability of cryogenic optical system** [11763-274]
- 11763 69 **Research on spatial image enhancement based on deep learning** [11763-275]
- 11763 6A **Realization of target detection in near-infrared remote sensing image** [11763-276]
- 11763 6B **A new data clustering algorithm based on the NEK-NN rule** [11763-278]
- 11763 6C **Research progress of true color digital night vision technology** [11763-279]
- 11763 6D **Classification of phytoplankton digital holograms using transfer learning** [11763-281]
- 11763 6E **Dynamic generation method of battlefield entities for parallel simulation** [11763-282]

11763 6F	Influence of MCP open area ratio and secondary electron emission layer on noise factor of image intensifier tubes [11763-283]
11763 6G	SFDR improvement of a phase-modulated analog photonic link [11763-284]
11763 6H	Image fusion localization algorithm based on SIFT and 3D model [11763-285]
11763 6I	Chaos synchronization in optically pumped quantum-dot spin-VCSELs [11763-286]
11763 6J	Research progress of digital holography in deep-sea in situ detection [11763-287]
11763 6K	Triangular frequency modulated microwave waveform generation with large time-bandwidth product using frequency-scanning laser [11763-293]
11763 6L	Clock synchronization using dichotomy based on polarization-entangled GHZ states [11763-295]
11763 6M	Off-chip far-field focusing with annular coupling gratings [11763-298]
11763 6N	A satellite on-board processing scheme based on photon frequency conversion [11763-299]
11763 6O	Research on microwave photonics mixer technology of HTS communication satellite [11763-300]
11763 6P	High-performance narrow-linewidth nanosecond pulsed fiber laser in 2 μm band [11763-303]
11763 6Q	Recognition of oil types based on fluorescence-lifetime decay curve and support vector machine [11763-305]
11763 6R	Influence of salt ions on the refractive index of seawater solution under different temperature [11763-306]
11763 6S	Picosecond laser system with fiber-solid hybrid amplification [11763-307]
11763 6T	High precision refractometer for salinity measurements based on aspheric surface [11763-308]
11763 6U	Underwater image enhancement by method combined the tail-gating and active polarization imaging technology [11763-310]
11763 6V	Single photon detection for dynamic targets [11763-311]
11763 6W	Analysis on coordinated anti-jamming of anti-missile early warning radar system based on intelligent optimization algorithm [11763-312]
11763 6X	Local color transfer based on optimal transmission theory [11763-313]

- 11763 6Y **High performance waveguide-coupled germanium p-i-n photodetector on doped silicon** [11763-314]
- 11763 6Z **Laser beam imaging technique for atmospheric detection** [11763-319]
- 11763 70 **A reconfigurable Si₃N₄ on-chip filter for programmable photonic processor** [11763-320]
- 11763 71 **Research on traverse extraction algorithm based on point cloud distribution characteristics of overhead transmission lines** [11763-324]
- 11763 72 **Application exploration of optical remote sensing technology of unmanned aerial vehicle in measuring bulk trade at sea** [11763-326]
- 11763 73 **Effect of coherent Doppler lidar pulse shape on the performance of maximum likelihood discrete spectral peak estimation** [11763-327]
- 11763 74 **Comparison of thermo-optic phase-shifters implemented on CUMEC silicon photonics platform** [11763-328]
- 11763 76 **Research on acceptance technology of transmission line infrastructure construction based on laser LiDAR technology** [11763-332]
- 11763 77 **Improving the detectivity of MoS₂ photodetector based on metal-semiconductor interface modification** [11763-334]
- 11763 78 **Study on the applicable distance scope of GN model to open cable** [11763-335]
- 11763 79 **Design of random vibration test condition for small satellite optical camera** [11763-336]
- 11763 7A **Research on autonomous decision method of multi-aircraft cooperative mid-range confrontation** [11763-337]
- 11763 7B **Moving target removal for lidar SLAM** [11763-338]
- 11763 7C **Reconstruction method for synthetic aperture Ladar** [11763-339]
- 11763 7D **Laser Doppler velocimetry signal processing based on stochastic resonance** [11763-340]
- 11763 7E **Optical system alignment technology based on high-precision surface error reduction** [11763-341]
- 11763 7F **Effect of the periodic size of nanoarray structure on electrical coupling properties of the living cells** [11763-342]
- 11763 7G **The method of improving the measurement accuracy of infrared laser ranging system** [11763-343]
- 11763 7H **A fiber-to-waveguide edge coupler assisted by silicon-nitride waveguide with large fabrication tolerance** [11763-344]

- 11763 7I **The design and simulation of a flexible support structure reflector mirror forIRST system**
[11763-345]
- 11763 7J **Quintuple Fano-like MIM plasmonics structure based on coupling resonators for refractive index sensing** [11763-346]
- 11763 7K **Measurement-device-independent quantum key distribution based on GHZ-entangled-state**
[11763-347]
- 11763 7L **Simulation and experiment of relativistic backward wave oscillator with non-uniform rectangular slow-wave structure** [11763-348]
- 11763 7M **Multi-scale information quantification framework in network information system environment**
[11763-349]
- 11763 7N **The introduction to ICCD or ICMOS performance evaluation method** [11763-351]
- 11763 7O **Analysis of the influence of filters on multi-detector hybrid stitching space camera** [11763-353]
- 11763 7P **Research on application of Scheimpflug condition in rail profile measurement** [11763-354]
- 11763 7Q **Study on photoelastic imaging technology of ultrasonic guided wave in rails for high speed railway** [11763-355]
- 11763 7R **Analysis about optical characteristics simulation of stationary target based on surface emissivity design** [11763-358]
- 11763 7S **Multi-period dynamic evaluation of soil loss in loess area** [11763-359]
- 11763 7T **Super-solution technology for low light level imaging in the field of remote sensing** [11763-360]
- 11763 7U **Research on multi-target detection method based on deep learning** [11763-362]
- 11763 7V **A photonic beamformer based on integrated optical delay line** [11763-363]
- 11763 7W **Classical-quantum signals simultaneous transmission sharing a same fiber based on mode division multiplexing** [11763-365]
- 11763 7X **BER performance of the polar-coded underwater wireless optical communication** [11763-366]
- 11763 7Y **Design and analysis of bending insensitive multi-core fiber** [11763-367]
- 11763 7Z **Inversion of ocean color constituents in the sea area around Dajin island based on CASI aerial hyperspectral data** [11763-368]
- 11763 80 **Silicon photonics integrated circuits and its application in data center** [11763-369]
- 11763 81 **Mapping of urban typical land covers using GaoFen-5 data: linear spectral unmixing based on a novel spectral analysis technique** [11763-370]

- 11763 82 **High sensitivity strain sensor based on curved LPG fabricated in eccentric hollow-core fiber**
[11763-375]
- 11763 83 **A single channel frequency measurement scheme based on photonic compressed sampling**
[11763-377]

Part Four

- 11763 84 **Detection method of tubular target leakage based on deep learning** [11763-378]
- 11763 85 **Design and calculation to reduce the polarization sensitivity of COCTS on GEO satellite**
[11763-379]
- 11763 86 **Weak reflectivity measurement of FBGs by method of grating scale** [11763-380]
- 11763 87 **A research on non-uniformity index of star sensor based on CMOS** [11763-381]
- 11763 88 **On-orbit MTF test method of GEO optical satellite based on random phase sampling of critical linear targets** [11763-382]
- 11763 89 **Technical research on crosstalk-free polarization control devices used for blue-green light band** [11763-383]
- 11763 8A **Atmospheric correction of GF-5 AHSI data and accuracy evaluation** [11763-384]
- 11763 8B **The research on the effect of spectral distributions on specular gloss measurement** [11763-386]
- 11763 8C **On-line temperature measurement for OC-FBG in fiber oscillator** [11763-387]
- 11763 8D **Identification of jellyfish in marine environment based on polarization** [11763-388]
- 11763 8E **Lidar observation and analysis of an aerosol pollution incident in Hefei** [11763-389]
- 11763 8F **Integrated design of Lidar detection and acquisition system based on FPGA** [11763-391]
- 11763 8G **Design and analysis high extinction ratio monolithic polarization-integrated super pixel long wavelength infrared detectors** [11763-392]
- 11763 8H **Measurement-device-independent quantum key distribution based on W state** [11763-393]
- 11763 8I **Design of 2.3 μm low threshold single mode GaSb DBR lasers based on high order slotted surface grating** [11763-394]
- 11763 8J **Research on application of 200 μm outer diameter optical fiber in electric telecommunication network construction** [11763-397]

- 11763 8K **Design and implementation of compensated phase for digital holography** [11763-398]
- 11763 8L **A high-efficiency long-wavelength surface emitting laser** [11763-400]
- 11763 8M **Design of CMOS HD imaging system with adaptive dynamic exposure control based on FPGA** [11763-401]
- 11763 8N **Study on airborne daytime star sensor based on volume grating** [11763-402]
- 11763 8O **Silicon nitride integrated two-dimensional wavelength tuning optical phased array** [11763-403]
- 11763 8P **A 3D geometric dimensional measurement method of step height** [11763-404]
- 11763 8Q **Magnetorheological fluid circulation system structure under the condition of small flow rate in magnetorheological polishing** [11763-405]
- 11763 8R **Magnetorheological removal function spurious fringes elimination method based on characteristic spectrum band-stop filter** [11763-406]
- 11763 8S **Research on generation method milling aspheric surface** [11763-407]
- 11763 8T **Design of chromatic confocal quantitative inverse dispersive objective lens** [11763-408]
- 11763 8U **X-ray communication experiment using photocathode x-ray tube** [11763-409]
- 11763 8V **Characteristic research of homemade FBG-based thulium fiber laser** [11763-410]
- 11763 8W **Design and fabrication of silicon immersion grating** [11763-411]
- 11763 8X **The calibration of UV solar simulator used for in vivo determination of the sun protection factor (SPF)** [11763-413]
- 11763 8Y **Adaptive high ratio zoom system engineering implementation** [11763-414]
- 11763 8Z **High resolution single-photon imaging for recognition of camouflaged target** [11763-415]
- 11763 90 **Design of portable target simulation system with adjustable radiation band** [11763-416]
- 11763 91 **High-precision piston detection method for segments based on a single convolutional neural network** [11763-417]
- 11763 92 **Design and application of longwave infrared dynamic dual target simulation system** [11763-418]
- 11763 93 **Research on image fusion algorithm based on K-means clustering and NSCT** [11763-419]
- 11763 94 **A small object detection method based on CNN in serial multispectral images** [11763-420]

- 11763 95 **Review of the overall parameter analysis of detection system of STSS [11763-421]**
- 11763 96 **Study on the stable output method of Mach-Zehnder frequency domain depolarization system [11763-423]**
- 11763 97 **An improved online multiple object tracking algorithm based on KFHT motion compensation model in the aerial videos [11763-426]**
- 11763 98 **Frequency response calibration technology of optical eye diagram analyzer based on femtosecond laser [11763-427]**
- 11763 99 **Hyperspectral imaging method for noninvasive quantitative detection of vulvar lichen sclerosis: a pilot study [11763-428]**
- 11763 9A **Tunable micro-integrated narrow linewidth extended cavity diode laser at 780nm [11763-432]**
- 11763 9B **N-hour repeating equatorial orbit: a new method for remote sensing satellites [11763-433]**
- 11763 9C **An angle measurement algorithm based on ER-FT feature for high-voltage switch [11763-435]**
- 11763 9D **Investigation on irradiated characteristics of Tm-doped gain fiber [11763-436]**
- 11763 9E **Research on key technology of underwater acoustic communication based on Sagnac fiber optic hydrophone [11763-438]**
- 11763 9F **Experimental study of temperature characteristics in a low-light-level CMOS system [11763-439]**
- 11763 9G **A 64-element fiber laser hydrophone flank array [11763-441]**
- 11763 9H **A logarithmic response burst IRFPA ROIC with pixel level integration of memory [11763-443]**
- 11763 9I **Research on spatial domain image fusion algorithm based on energy segmentation [11763-445]**
- 11763 9J **A high speed high stable data receiving method for digital infrared FPAs [11763-446]**
- 11763 9K **Maximum entropy method for imaging through turbid medium [11763-447]**
- 11763 9L **Static model of flexible unloading device for space remote sensor [11763-448]**
- 11763 9M **The ground surveillance performance of equatorial remote sensing constellations [11763-451]**
- 11763 9N **Analysing of key technology and application of N×200Gbit/s for long distance transmission [11763-457]**
- 11763 9O **Study on alignment technology of off-axis four-mirror optical systems based on vector aberration theory [11763-458]**

- 11763 9P **Design of off-axis four-mirror optical system based on vector aberration theory** [11763-459]
- 11763 9Q **Design, adjustment and verification for the laser beam expanding system of ZY-3(03) space-borne laser altimeter** [11763-460]
- 11763 9R **Special active fiber for high power lasers** [11763-461]
- 11763 9S **The environment phase noise in interferometric** [11763-462]
- 11763 9T **Analysis of the distribution characteristics of the states of polarization based on improved Delaunay triangulation algorithm** [11763-463]
- 11763 9U **The influence of the frequency modulation induced laser amplitude modulation on the calibration of the 3×3 coupler parameters and its suppression** [11763-467]
- 11763 9V **Stray light test facility for multispectral spaced-based optical system with large field of view** [11763-468]
- 11763 9W **Application and analysis of mirror discrete support technology in optical remote sensor** [11763-472]
- 11763 9X **Method of retrieving the hollow scale of target based on dynamic changes of radiation energy** [11763-474]
- 11763 9Y **Seasonal change analysis of multispectral BRDF for different surface types** [11763-476]
- 11763 9Z **Anodic fluoride passivation of InAs/GaSb superlattice for mid-/short-wavelength dual-color infrared detector** [11763-479]
- 11763 A0 **An uncooled infrared and ICMOS image fusion system based on FPGA** [11763-480]
- 11763 A1 **Projection drift alignment by acquisition time division for x-ray nanotomography** [11763-483]
- 11763 A2 **Minitype optical fiber cantilever acceleration sensor** [11763-485]
- 11763 A3 **A multi-objective anomaly abnormal detection method based on the infrared and optical image fusion** [11763-486]
- 11763 A4 **Research progress of SiGe heterojunction photodetectors** [11763-487]
- 11763 A5 **Subsurface material recognition based on infrared time variation characteristics** [11763-488]
- 11763 A6 **Discussion on the technology and application of next generation WDM system** [11763-493]
- 11763 A7 **Moving point target detection based on temporal analysis of pixels in very low SNR** [11763-495]
- 11763 A8 **Design of silicon nitride arrayed waveguide grating at 2μm wavelength band** [11763-496]

- 11763 A9 **Research on test method of key technical index of airborne remote laser ranging system**
[11763-498]
- 11763 AA **Design of integrated performance testing equipment for ranging/irradiator** [11763-499]
- 11763 AB **Low-lever light detection scheme based on the novel gate-controlled lateral thyristor**
[11763-501]
- 11763 AC **Binomial coefficient compared to standard normal distribution effect of fluctuations** [11763-502]
- 11763 AD **Design of visible light target with adjustable multi-dimensional parameters** [11763-503]
- 11763 AE **Mobile laser ranging cooperative target** [11763-505]
- 11763 AF **Laboratory performance test of downhole fiber laser geophone** [11763-507]
- 11763 AG **A novel dual guided photonic crystal fiber for OAM mode transmission** [11763-508]
- 11763 AH **All optical fiber mode selective coupler based on non-weak guided fiber** [11763-509]