

# LOP

Laser &  
Optoelectronics  
Progress

中文核心期刊 中国科技核心期刊



## 2017.1

# 激光与光电子学进展

第54卷 VOL. 54 第1期 NO. 1 [总第612期]



 中国激光杂志社  
CHINESE LASER PRESS

中国科学院上海光学精密机械研究所 主办

万方数据

## 目次

### • 综述 •

|                             |                         |
|-----------------------------|-------------------------|
| 中尺度气象模式预报大气光学湍流的现状与展望 ..... | 吴晓庆 010001              |
| 光纤放大网络及其应用研究进展 .....        | 李宏勋, 张锐 010002          |
| 高平均功率固体激光器研究现状及其发展趋势 .....  | 甘啟俊, 姜本学, 张攀德, 等 010003 |
| 皮秒激光微纳加工研究进展 .....          | 杨冬冬, 蔡京辉 010004         |

### • 大气光学与海洋光学 •

|                               |                         |
|-------------------------------|-------------------------|
| 基于激光雷达的京津冀地区大气边界层高度特征研究 ..... | 吕立慧, 刘文清, 张天舒, 等 010101 |
| 低纬度地区红外波段大气透射率研究 .....        | 寇人可, 王海晏, 吴学铭 010102    |

### • 光纤光学与光通信 •

|                            |                         |
|----------------------------|-------------------------|
| 传感头误差对便携式光纤电流互感器的影响 .....  | 王夏霄, 张宇宁, 于佳, 等 010601  |
| 光纤电流传感器性能分析及环形衰荡结构设计 ..... | 孙滨超, 沈涛 010602          |
| 基于相位掩模法的高阶布拉格波导光栅特性 .....  | 张爱玲, 田红苗, 李青青, 等 010603 |
| 地理式光纤入侵监测系统研究 .....        | 李淑娟, 王昌, 张发祥, 等 010604  |

### • 图像处理 •

|                                  |                         |
|----------------------------------|-------------------------|
| 基于透射率优化和色温调节的水下图像复原 .....        | 倪锦艳, 李庆武, 周亚琴, 等 011001 |
| 基于目标提取与拉普拉斯变换的红外和可见光图像融合算法 ..... | 汪玉美, 陈代梅, 赵根保 011002    |
| 基于曲率特征的迭代最近点算法配准研究 .....         | 曾繁轩, 李亮, 刁鑫鹏 011003     |

### • 成像系统 •

|                             |                     |
|-----------------------------|---------------------|
| 基于补偿干涉仪的串联式全场光学相干层析系统 ..... | 郭英呈, 高万荣, 朱越 011101 |
|-----------------------------|---------------------|

### • 仪器、测量与计量 •

|                              |                         |
|------------------------------|-------------------------|
| 基于分区背景估计的两步相移干涉相位盲解调算法 ..... | 周志盛, 董玉明, 焦国华, 等 011201 |
| 基于光栅预校正的三维面形测量方法 .....       | 边心田, 程菊, 左芬, 等 011202   |
| 四步空域准相移单帧载频条纹相位解调技术 .....    | 林锦新, 马骁, 李仕萍, 等 011203  |

### • 集成光学 •

|                         |                 |
|-------------------------|-----------------|
| 光子晶体偏振分束器的设计与性能分析 ..... | 张信祥, 陈鹤鸣 011301 |
|-------------------------|-----------------|

### • 激光器与激光光学 •

|                                      |                        |
|--------------------------------------|------------------------|
| 光纤光栅外腔半导体激光器噪声特性仿真 .....             | 王直圆, 陈超, 单肖楠, 等 011401 |
| 高温合金激光环切打孔技术 .....                   | 钱晓忠, 张丽, 任乃飞 011402    |
| Vague 集在 Cr12MoV 钢激光淬火工艺优化中的应用 ..... | 舒服华 011403             |

|                                       |                 |        |
|---------------------------------------|-----------------|--------|
| 保护气体对薄板 A304 光纤激光焊接接头形貌和力学性能的影响 ..... | 樊宇, 李沛智, 柳岸敏, 等 | 011404 |
| 基于粉体熔化的选区激光熔化成型方向误差分析 .....           | 张博, 李涤尘, 曹毅, 等  | 011406 |
| 反向传播人造神经网络预测激光微孔表面粗糙度 .....           | 丁华, 李炎蔚, 袁冬青    | 011407 |

## • 材料 •

|                              |                 |        |
|------------------------------|-----------------|--------|
| Fe-S 共掺杂纤锌矿 ZnO 的第一性原理 ..... | 韩伟超, 张頌, 欧满琳, 等 | 011601 |
|------------------------------|-----------------|--------|

## • 非线性光学 •

|                       |                 |        |
|-----------------------|-----------------|--------|
| 高斯光束小尺度自聚焦的临界功率 ..... | 邓剑钦, 王兴龙, 刘侠, 等 | 011901 |
|-----------------------|-----------------|--------|

## • 光学设计与制造 •

|                                |                  |        |
|--------------------------------|------------------|--------|
| 机场跑道临时关闭警示灯光强计算方法研究 .....      | 侯启真, 刘衍帆, 薛荣荣    | 012201 |
| 板上芯片型 LED 光源均匀照明自由曲面透镜设计 ..... | 梁文跃, 李远兴, 龙拥兵, 等 | 012202 |
| 大口径非球面透镜支撑方法的优化 .....          | 朱星中, 宫雪非         | 012203 |
| 虹膜识别镜头的光学设计 .....              | 高永锋, 张变, 宋光辉, 等  | 012204 |

## • 光学器件 •

|                               |               |        |
|-------------------------------|---------------|--------|
| 基于多通道实时动态反馈的 LED 智能照明系统 ..... | 陈恩果, 周心禹, 郭太良 | 012301 |
|-------------------------------|---------------|--------|

## • 表面光学 •

|                                  |              |        |
|----------------------------------|--------------|--------|
| 基于石墨烯等离子体表面处理改善 pH 传感特性的研究 ..... | 吴冬芹, 黄翀, 杨玮枫 | 012401 |
|----------------------------------|--------------|--------|

## • 物理光学 •

|                       |         |        |
|-----------------------|---------|--------|
| 太赫兹贝塞尔谐振腔的设计与分析 ..... | 黄晗, 余燕忠 | 012601 |
|-----------------------|---------|--------|

## • 量子光学 •

|                          |               |        |
|--------------------------|---------------|--------|
| 降雨背景下自由空间量子通信的性能研究 ..... | 高锐, 聂敏, 杨光, 等 | 012701 |
|--------------------------|---------------|--------|

## • 遥感与传感器 •

|                                 |                  |        |
|---------------------------------|------------------|--------|
| 基于金字塔变换算法优化的遥感图像融合 .....        | 牛颖超, 周忠发, 谢雅婷, 等 | 012801 |
| 激光雷达反演气溶胶光学特性的 $k$ 值准确度研究 ..... | 孙海波, 曹念文         | 012802 |

## • 散射 •

|                                 |                 |        |
|---------------------------------|-----------------|--------|
| 希尔伯特-黄变换的纳米颗粒 Zeta 电位分析方法 ..... | 鲁梦娣, 邱健, 余宛真, 等 | 012901 |
|---------------------------------|-----------------|--------|

## • 光谱学 •

|                                        |               |        |
|----------------------------------------|---------------|--------|
| Gaussian-LM 算法在光纤布拉格光栅反射光谱寻峰中的应用 ..... | 胡正文, 庞成鑫, 程冯宇 | 013001 |
|----------------------------------------|---------------|--------|

## • 薄膜 •

|                                                                             |                  |        |
|-----------------------------------------------------------------------------|------------------|--------|
| 脉冲激光沉积法合成 $(\text{Bi}, \text{Er})_2\text{Ti}_2\text{O}_7$ 介电薄膜及其上转换发光 ..... | 梁立容, 王凤, 邱泽敏     | 013101 |
| 热退火处理对氧化铟锡薄膜光电特性的影响 .....                                                   | 肖和平, 郭冠军, 马祥柱, 等 | 013102 |

## • 资讯 •

|                             |  |           |
|-----------------------------|--|-----------|
| 《激光与光电子学进展》增设“资讯”栏目通知 ..... |  | 010001-10 |
| 《高性能激光晶体制造工艺与装备》项目简介 .....  |  | 013601    |

# CONTENTS

## • Reviews •

|                                                                                                                   |                                              |        |
|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------|
| Current Situation and Prospect of Mesoscale Meteorological Model in Atmospheric Optical Turbulence Forecast ..... | Wu Xiaoqing                                  | 010001 |
| Progress of Fiber Amplification Network and Its Application Progress .....                                        | Li Hongxun, Zhang Rui                        | 010002 |
| High Average Power Solid-State Lasers .....                                                                       | Gan Qijun, Jiang Benxue, Zhang Pande, et al. | 010003 |
| Micro-Nano Fabrication by Picosecond Laser .....                                                                  | Yang Dongdong, Cai Jinghui                   | 010004 |

## • Atmospheric Optics and Oceanic Optics •

|                                                                                   |                                              |        |
|-----------------------------------------------------------------------------------|----------------------------------------------|--------|
| Characteristics of Boundary Layer Height in Jing-Jin-Ji Area Based on Lidar ..... | Lǔ Lihui, Liu Wenqing, Zhang Tianshu, et al. | 010101 |
| Atmospheric Transmittance at Infrared Band in Low Latitude Areas .....            | Kou Renke, Wang Haiyan, Wu Xueming           | 010102 |

## • Fiber Optics and Optical Communications •

|                                                                                             |                                                  |        |
|---------------------------------------------------------------------------------------------|--------------------------------------------------|--------|
| Influence of Sensing Coil Errors on Portable Fiber-Optic Current Transformer .....          | Wang Xiaoxiao, Zhang Yuning, Yu Jia, et al.      | 010601 |
| Performance Analysis for Fiber Current Sensor and Design for Loop Ring-Down Structure ..... | Sun Binchao, Shen Tao                            | 010602 |
| Characteristics of High-Order Bragg Waveguide Grating Based on Phase-Mask Method .....      | Zhang Ailing, Tian Hongmiao, Li Qingqing, et al. | 010603 |
| Buried Optical Fiber Intrusion Monitoring System .....                                      | Li Shujuan, Wang Chang, Zhang Faxiang, et al.    | 010604 |

## • Image Processing •

|                                                                                                                   |                                          |        |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------|
| Underwater Image Restoration Based on Transmittance Optimization and Color Temperature Adjustment .....           | Ni Jinyan, Li Qingwu, Zhou Yaqin, et al. | 011001 |
| Image Fusion Algorithm of Infrared and Visible Images Based on Target Extraction and Laplace Transformation ..... | Wang Yumei, Chen Daimei, Zhao Genbao     | 011002 |
| Iterative Closest Point Algorithm Registration Based on Curvature Features .....                                  | Zeng Fanxuan, Li Liang, Diao Xinpeng     | 011003 |

## • Imaging Systems •

|                                                                                               |                                     |        |
|-----------------------------------------------------------------------------------------------|-------------------------------------|--------|
| Compensation Interferometer Based Tandem Full-Field Optical Coherence Tomography System ..... | Guo Yingcheng, Gao Wanrong, Zhu Yue | 011101 |
|-----------------------------------------------------------------------------------------------|-------------------------------------|--------|

## • Instrumentation, Measurement and Metrology •

|                                                                                                                          |                                                 |        |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|--------|
| Phase Blind Demodulation Algorithm for Two-Step Phase-Shifting Interferometry Based on Zoned Background Estimation ..... | Zhou Zhisheng, Dong Yuming, Jiao Guohua, et al. | 011201 |
| A Method of 3D Shape Measurement Based on Alignment Grating Projection .....                                             | Bian Xintian, Cheng Ju, Zuo Fen, et al.         | 011202 |
| Four-Step Spatial Quasi-Phase-Shifting Technique for Phase Demodulation from a Single Carrier Fringe Pattern .....       | Lin Jinxin, Ma Xiao, Li Shiping, et al.         | 011203 |

## • Integrated Optics •

|                                                                                    |                             |        |
|------------------------------------------------------------------------------------|-----------------------------|--------|
| Design and Performance Analysis of Photonic Crystal Polarizing Beam Splitter ..... | Zhang Xinxiang, Chen Heming | 011301 |
|------------------------------------------------------------------------------------|-----------------------------|--------|

## • Lasers and Laser Optics •

|                                                                                             |                                               |        |
|---------------------------------------------------------------------------------------------|-----------------------------------------------|--------|
| Simulation of Noise Characteristics of Fiber Grating External Cavity Lasers .....           | Wang Zhiyuan, Chen Chao, Shan Xiaonan, et al. | 011401 |
| Technology in Laser Trepanning of Superalloys .....                                         | Qian Xiaozhong, Zhang Li, Ren Naifei          | 011402 |
| Application of Vague Set in Process Optimization of Laser Quenching of Cr12MoV Steels ..... | Shu Fuhua                                     | 011403 |

|                                                                                                                                                                  |                                                  |        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------|
| Effect of Shielding Gas on Joint Morphology and Mechanical Property of Fiber Laser Welding of A304 Thin Sheet                                                    | Fan Yu, Li Peizhi, Liu Anmin, et al.             | 011404 |
| Error Analysis in Formation Direction of Selective Laser Melting Based on Powder Melting                                                                         | Zhang Bo, Li Dichen, Cao Yi, et al.              | 011406 |
| Roughness Prediction of Laser Drilling Pore Surface Based on Back-Propagation Artificial Neural Networks                                                         | Ding Hua, Li Yanwei, Yuan Dongqing               | 011407 |
| <b>• Materials •</b>                                                                                                                                             |                                                  |        |
| First-Principles of Fe-S Co-Doped Wurtzite ZnO                                                                                                                   | Han Weichao, Zhang Song, Ou Manlin, et al.       | 011601 |
| <b>• Nonlinear Optics •</b>                                                                                                                                      |                                                  |        |
| Critical Power for Small-Scale Self-Focusing of Gaussian Beam                                                                                                    | Deng Jianqin, Wang Xinglong, Liu Xia, et al.     | 011901 |
| <b>• Optical Design and Fabrication •</b>                                                                                                                        |                                                  |        |
| Method to Calculate Light Intensity of Warning Light for Temporary Closure of Airport Runway                                                                     | Hou Qizhen, Liu Yanfan, Xue Rongrong             | 012201 |
| Design of Freeform Surface Lens with Chip on Board LED Sources for Uniform Illumination                                                                          | Liang Wenyue, Li Yuanxing, Long Yongbing, et al. | 012202 |
| Optimization on Supporting Method of Large-Aperture Aspheric Lens                                                                                                | Zhu Xingshen, Gong Xuefei                        | 012203 |
| Optical Design of Iris Recognition Lens                                                                                                                          | Gao Yongfeng, Zhang Bian, Song Guanghui, et al.  | 012204 |
| <b>• Optical Devices •</b>                                                                                                                                       |                                                  |        |
| LED Intelligent Lighting System Based on Multi-Channel Real-Time Dynamic Feedback                                                                                | Chen Enguo, Zhou Xinyu, Guo Tailiang             | 012301 |
| <b>• Optics at Surfaces •</b>                                                                                                                                    |                                                  |        |
| Improvement on pH Sensing Properties Based on Surface Treatment of Graphene Plasma                                                                               | Wu Dongqin, Huang Chong, Yang Weifeng            | 012401 |
| <b>• Physical Optics •</b>                                                                                                                                       |                                                  |        |
| Design and Analysis of Bessel Resonator at Terahertz Frequencies                                                                                                 | Huang Han, Yu Yanzhong                           | 012601 |
| <b>• Quantum Optics •</b>                                                                                                                                        |                                                  |        |
| Performance of Free-Space Quantum Communication in Context of Rainfall                                                                                           | Gao Kun, Nie Min, Yang Guang, et al.             | 012701 |
| <b>• Remote Sensing and Sensors •</b>                                                                                                                            |                                                  |        |
| Remote Sensing Image Fusion Based on Pyramid Transform Algorithm Optimization                                                                                    | Niu Yingchao, Zhou Zhongfa, Xie Yating, et al.   | 012801 |
| Accuracy of Value $k$ in Aerosol Inversion Optic Properties Based on Lidar                                                                                       | Sun Haibo, Cao Nianwen                           | 012802 |
| <b>• Scattering •</b>                                                                                                                                            |                                                  |        |
| Study on Nanoparticle Zeta Potential Based on Hilbert-Huang Transform                                                                                            | Lu Mengdi, Qiu Jian, Yu Wanzhen, et al.          | 012901 |
| <b>• Spectroscopy •</b>                                                                                                                                          |                                                  |        |
| Application of Gaussian-LM Algorithm in Fiber Bragg Grating Reflection Spectrum Peak Search                                                                      | Hu Zhengwen, Pang Chengxin, Cheng Fengyu         | 013001 |
| <b>• Thin Films •</b>                                                                                                                                            |                                                  |        |
| Synthesization of $(\text{Bi} \cdot \text{Er})_2\text{Ti}_2\text{O}_7$ Dielectric Thin Films by Pulse Laser Deposition Method and Its Up-Conversion Luminescence | Liang Lirong, Wang Feng, Qiu Zemin               | 013101 |
| Influence of Thermal Annealing on Photoelectrical Properties of Indium-Tin Oxide Thin Films                                                                      | Xiao Heping, Guo Guanjun, Ma Xiangzhu, et al.    | 013102 |

原书缺封底