

ISSN 1007-2276

红外与激光工程

INFRARED AND LASER ENGINEERING

2013

Vol.42 No.1

被下列检索机构收录：

美国工程索引 (EI Compendex)

英国科学文摘(SA)

俄罗斯文摘杂志(AJ)

美国剑桥科学文摘(CSA)

日本科学技术社数据库(JST)

中文核心期刊要目总览

中国科技论文统计源期刊

中国学术期刊(光盘版)

万方数据库

中文科技期刊数据库

中国科学引文数据库

中国无线电电子学文摘

中国电子科技文摘

中国航天科工集团公司
《红外与激光工程》编辑部

红外与激光工程

HONGWAI YU JIGUANG GONGCHENG

月刊 1972年创刊

2013年第42卷第1期

(总第219期)

主管单位 中国航天科工集团公司
主办单位 中国航天科工集团公司第三
研究院第八三五八研究所
编辑出版 《红外与激光工程》编辑部
印刷单位 天津中铁物资印业有限公司
国内发行 天津市邮政局
订购处 全国各地邮局
邮发代号 6-133
国外发行 中国国际图书贸易总公司
(北京399信箱)
国外代号 BM 1766
主 编 崔玉平
执行主编 卢 进
副 主 编 张天序 陈德应 史泽林
陈 钱 宋璞林
常务副主编 赵雪燕
执行编辑 翟远征
责任编辑 刘俊杰 许文颖
排 版 刘俊杰
通信地址 天津市空港经济区中环西路
58号
邮政编码 300308
联系电话 022-58168883
022-58168885
传 真 022-58168884
电子信箱 irla@vip.sina.com
网 址 http://www.irla.cn
刊 号 ISSN 1007-2276
CN 12-1261/TN
广告经营许可证号 1201044000019
国内定价 45元
刊名题词 张爱萍将军
出版日期 2013年1月25日

目 次

◆ 红外技术及应用 ◆

- 超音速导弹温度场建模与仿真·····吴龙宝,谢晓方,王诚成,等(0001)
飞行器后机身蒙皮红外辐射特性(英文)·····徐顶国,冯维林,桑建华(0007)
红外隐身技术发展趋势·····桑建华,张宗斌(0014)
装甲车辆与地面背景的热交互作用及红外仿真·····
·····韩玉阁,成志铎,任登凤,等(0020)
红外搜索跟踪系统作用距离等效折算·····张 乐,梁冬明,姚 梅,等(0026)
大型红外辐射面源的设计·····钱 婧,孙胜利,于胜云,等(0031)
考虑积分时间变量的红外系统辐射响应定标·····罗茂捷,周金梅,傅景能,等(0036)
基于梯度信息融合的海面红外目标实时检测·····万 磊,曾文静,张铁栋,等(0041)
InSb 红外探测器芯片金丝引线键合工艺研究·····朱炳金,林 磊,宋开臣,等(0046)

◆ 激光与光电子技术应用 ◆

- 太赫兹波谱与成像技术·····郭澜涛,牧凯军,邓 朝,等(0051)
非线性偏振旋转锁模光纤激光器数值模型(英文)·····
·····左 林,杨爱英,赖俊森,等(0057)
中心对称和非中心对称单光子光折变空间屏蔽灰孤子的时间特性·····
·····吉选芒,姜其畅,苏艳丽,等(0063)
光子晶体调制半导体激光器侧模·····张建心,刘 磊,陈 微,等(0069)
基于迈克尔逊腔光纤激光相干合成的输出特性·····
·····王 倩,宋兴亮,刘广义,等(0073)
激光伸缩系统波前畸变精度分析·····赵建科,李 霞,徐 亮,等(0079)
激光近炸引信单光束脉冲周向探测技术·····甘 霖,张 合,张祥金,等(0084)
 β -内酰胺类抗生素药物的太赫兹光谱·····戴 浩,徐开俊,金飏兵,等(0090)
基于超磁致伸缩材料的高速倾斜镜的设计与应用·····
·····姚佰栋,时晶晶,侯再红,等(0096)
光纤位移干涉仪的研制及其在 Hopkinson 压杆实验中的应用·····
·····杨 军,王克逸,徐海斌,等(0102)
34 μm 孔径 GaAs 偶极子光电导天线辐射特性仿真研究·····
·····张李伟,尚丽平,唐金龙,等(0108)
单脉冲激光对 CCD 探测器的硬损伤及损伤概率·····
·····朱志武,张 震,程湘爱,等(0113)

◆ 光通信与光传感 ◆

- 基于 RBF 神经网络的光纤陀螺启动补偿及应用·····
·····沈 军,缪玲娟,吴军伟,等(0119)
自适应光学校正下空间光通信的光纤耦合效率及斯特列尔比·····
·····韩立强,王志斌(0125)
衍射光学元件在卫星激光通信终端中的潜在应用(英文)·····
·····俞建杰,韩琦琦,马 晶,等(0130)

期刊基本参数: CN12-1261/TN*1972*m*A4*284*zh+en*P*¥45.00*1150*50*2013-01

◆先进光学◆

- 大视场红外折反光学系统杂散光分析……………王文芳,杨晓许,姜凯,等(0138)
90°离轴角红外滚仰式导引头光学系统……………张鑫,贾宏光(0143)
折射/衍射混合长波红外连续变焦光学系统设计……………王保华,刘英,孙强,等(0148)
国外高速导弹的头罩防护技术……………张科,陈之光,赵玉印(0154)
非相干LED白光产生无衍射光的光源设计……………方翔,江新光,吴逢铁,等(0159)
非球面内表面调制的自由曲面配光透镜设计方法……………
……………孙秀辉,杜惊雷,尹韶云,等(0163)
基于非球形雨滴的降雨对激光传输衰减的影响……………刘西川,高太长,刘磊(0167)
通用大气辐射传输软件(CART)分子吸收和热辐射计算精度验证……………
……………戴聪明,魏合理,陈秀红(0174)

◆光学晶体与薄膜◆

- 大面积头罩上类金刚石薄膜均匀性研究……………付秀华,杨永亮,刘国军,等(0181)
用于红外光学窗口的多层保护膜……………刘士军,李钱陶,熊长新,等(0185)
激光预处理中薄膜损伤形貌对预处理效果的影响……………代福,杨李茗(0190)
TeO₂晶体旋光性对其分光特性的影响分析……………谭见瑶,任玉,谭勇,等(0195)
晶格常数对光子晶体量子阱透射谱的影响……………苏安(0200)
应用权重计算方法的光学遥感器材料间匹配性研究……………
……………刘强,张峰,何欣,等(0206)

◆光电测量

- 高动态星跟踪方法……………金雁,江洁,张广军(0212)
复合轴精密跟踪技术的应用与发展……………马佳光,唐涛(0218)
直角棱镜棱脊不平度的检测方法……………赵军丽,吴易明,高立民(0228)
相位调制光外差稳频信号检测技术……………胡姝玲,耿伟彪,苑丹丹,等(0233)
采用开放光路FTIR光谱法的1,3-丁二烯测量研究……………
……………童晶晶,高闽光,徐亮,等(0239)

◆信息处理◆

- 基于独立成分分析的舰船气泡尾流后向散射光信号处理……………
……………万俊,张晓晖,饶炯辉,等(0244)
目标探测多波段图像统一复原及实验验证……………洪汉玉,李良成,章秀华,等(0251)
逆合成孔径激光雷达鸟类目标压缩感知识别方法……………
……………朱丰,张群,冯有前,等(0256)
同时偏振成像探测系统的偏振图像配准研究……………杨长久,李双,袁桢炜,等(0262)
利用期望最大化算法的EMCCD噪声分布模型的参数估计……………
……………邹盼,刘晖,张闻文,等(0268)
Terra MODIS第5波段红外遥感影像条带噪声的探测与校正……………
……………王荣彬,曾超,姜湾,等(0273)
低信噪比红外图像直线段检测算法……………艾锐,史泽林,张程硕(0278)

《红外与激光工程》系中国宇航学会光电技术专业委员会会刊,由中国航天科工集团公司主管,创刊于1972年,是国家科委和国家新闻出版署批准的国内外公开发行的国家级学术刊物。中文核心期刊。

《红外与激光工程》是中国航天界光电子技术领域内学术性与工程应用性集于一体的综合性刊物,主要刊登国内红外与激光技术方面的学术论文和工程研究报告,集中反映了中国光电技术的工程应用水平。

期刊的编委会由100余人组成,其中包括金国藩、张履谦、周立伟、姚建铨、褚君浩等院士,及其他国内光电领域著名的专家、学者,他们来自航天、航空、兵器、电子、机械系统及中国科学院,国内著名大学,有他们审稿把关,期刊质量得到提高。

《红外与激光工程》常设专栏包括红外技术及应用,激光与光电子技术应用,光电对抗,先进光学,光电测量,信息处理等。

INFRARED AND LASER ENGINEERING

Monthly Started in 1972

Vol. 42 No.1 2013 (Series No. 219)

Competent Authorities China Aerospace
Science and Industry Corporation
(CASIC)

Sponsor 8358th Institute of 3rd Academy,
China Aerospace Science and
Industry Corporation

Edited and Published by Editorial Board
of Journal of Infrared and Laser Engin-
eering

Printed by Tianjin Zhongtie Materials
Print CO.,LTD.

Domestic Distributor Tianjin Post Office

Order Office All Local Post Offices in
China (6-133)

Overseas Distributor China International
Book Trading Corporation (BM 1766)

Editor in Chief Cui Yuping

Executive Editor in Chief Lu Jin

Deputy Editor in Chief

Zhang Tianxu Chen Deying

Shi Zelin Chen Qian

Song Yinglin

Executive Deputy Editor in Chief

Zhao Xueyan

Executive Editor Zhai Yuanzheng

Editor Liu Junjie Xu Wenying

Typesetter Liu Junjie

Address Airport Economic Zone

Zhonghuan West Road 58, Tianjin,
China (300308)

Tel 86-22-58168885 86-22-58168883

Fax 86-22-58168885

Email irla@vip. sina. com

Net Address <http://www.irla.cn>

Price ¥45

Published Data 25 Jan 2013

Contents

❖ Infrared technology and application ❖

- Modeling and simulation of supersonic missile temperature distribution.....
.....Wu Longbao, Xie Xiaofang, Wang Chengcheng, et al(0001)
- IR characteristics of aircraft aft fuselage skin.....
.....Xu Dingguo, Feng Weilin, Sang Jianhua (0007)
- Development trends of infrared stealth technology... Sang Jianhua, Zhang Zongbin (0014)
- Thermal interactions and infrared simulation of armored vehicles and ground
background.....Han Yuge, Cheng Zhiduo, Ren Dengfeng, et al (0020)
- Equivalent calculation of operating range ofIRST.....
.....Zhang Le, Liang Dongming, Yao Mei, et al (0026)
- Design of large size infrared radiant planar source.....
.....Qian Jing, Sun Shengli, Yu Shengyun, et al (0031)
- Integration time as variable for radiometric calibration of infrared system.....
.....Luo Maojie, Zhou Jinmei, Fu Jingneng, et al (0036)
- Real-time detection of marine infrared objects based on the fusion of gradient
information.....Wan Lei, Zeng Wenjing, Zhang Tiedong, et al (0041)
- InSb infrared detector chip gold wire bonding process study.....
.....Zhu Bingjin, Lin Lei, Song Kaichen, et al (0046)

❖ Laser and optoelectronic technology application ❖

- Terahertz spectroscopy and imaging...Guo Lantao, Mu Kaijun, Deng Chao, et al (0051)
- Numerical model for nonlinear polarization rotation mode-locked fiber laser.....
.....Zuo Lin, Yang Aiyang, Lai Junsen, et al (0057)
- Temporal behavior of the screening grey spatial solitons in one-photon
centrosymmetric and non-centrosymmetric photorefractive crystals.....
.....Ji Xuanmang, Jiang Qichang, Su Yanli, et al (0063)
- Modulating lateral modes of semiconductor laser by photonic crystal structures.....
.....Zhang Jianxin, Liu lei, Chen Wei, et al (0069)
- Output of coherent combining of fiber laser in Michelson cavity.....
.....Wang Qian, Song Xingliang, Liu Guangyi, et al (0073)
- Laser beam wave-front error reduction accuracy analysis.....
.....Zhao Jianke, Li Xia, Xu Liang, et al (0079)
- Single-beam pulse circumferential detection technology of laser proximity fuze.....
.....Gan Lin, Zhang He, Zhang Xiangjin, et al (0084)
- Terahertz spectroscopy of β -lactam antibiotics.....
.....Dai Hao, Xu Kaijun, Jin Biaobing, et al (0090)
- Design and application of fast steering mirror based on GMM.....
.....Yao Baidong, Shi Jingjing, Hou Zaihong, et al(0096)
- Development of an optical-fiber displacement interferometer and its application in
Hopkinson pressure bar experiment...Yang Jun, Wang Keyi, Xu Haibin, et al (0102)
- Simulation of radiation characteristics of 34 μm aperture GaAs dipole photoconductive
antenna.....Zhang Liwei, Shang Liping, Tang Jinlong, et al (0108)
- Damage phenomenon and probability of CCD detectors under single-laser-pulse
irradiation.....Zhu Zhiwu, Zhang Zhen, Cheng Xiang'ai, et al (0103)

❖ **Optical communication and optical sensing** ❖

- Application and compensation for startup phase of FOG based on RBF neural network..... Shen Jun, Miao Lingjuan, Wu Junwei, et al (0119)
- Fiber coupling efficiency and Strehl ratio for space optical communication based on adaptive optics correction..... Han Liqiang, Wang Zhibin (0125)
- Potential application of diffractive optical elements in satellite laser communication terminals..... Yu Jianjie, Han Qiqi, Ma Jing, et al (0130)

❖ **Advanced optics** ❖

- Stray light analysis of catadioptric infrared optical system with large field... Wang Wenfang, Yang Xiaoxu, Jiang Kai, et al (0138)
- 90° off-axis angle infrared optical system of roll-pitch seeker..... Zhang Xin, Jia Hongguang (0143)
- Optical design for refractive/diffractive long wavelength infrared continuous zoom system..... Wang Baohua, Liu Ying, Sun Qiang, et al (0148)
- Dome protecting technologies for overseas high-velocity guided missiles... Zhang Ke, Chen Zhiguang, Zhao Yuyin, et al (0154)
- Design of incoherent light source LED for generating non-diffracting beams..... Fang Xiang, Jiang Xinguang, Wu Fengtie, et al (0159)
- Free-form lens design method based on the modulation of the aspheric inner surface for uniform illumination..... Sun Xiuhui, Du Jinglei, Yin Shaoyun, et al (0163)
- Effect of rainfall on laser transmission attenuation based on non-spherical raindrops... Liu Xichuan, Gao Taichang, Liu Lei (0167)
- Validation of the precision of atmospheric molecular absorption and thermal radiance calculated by combined atmospheric radiative transfer (CART) code..... Dai Congming, Wei Heli, Chen Xiuhong (0174)

❖ **Optical crystals and coatings** ❖

- Research of uniformity of diamond-like carbon on extensive head covering... Fu Xiuhua, Yang Yongliang, Liu Guojun, et al (0181)
- Multilayer protective coatings for IR optical windows..... Liu Shijun, Li Qiantao, Xiong Changxin, et al (0185)
- Effects of damaged appearance of coatings on its conditioning during laser conditioning..... Dai Fu, Yang Liming (0190)
- Impact of the rotatory property of TeO₂ crystal on its spectral characteristics... Tan Jianyao, Ren Yu, Tan Yong, et al (0195)
- Effect of lattice constants on transmission spectra of photonic crystal quantum well..... Su An (0200)
- Research of materials matching in optical remote sensor based on weight coefficient analysis method..... Liu Qiang, Zhang Feng, He Xin, et al (0206)

❖ **Photoelectric measurement** ❖

- Highly dynamic star tracking algorithm..... Jin Yan, Jiang Jie, Zhang Guangjun (0212)
- Review of compound axis servomechanism tracking control technology..... Ma Jiaguang, Tang Tao (0218)
- Detecting method of right-angled prism tilting..... Zhao Junli, Wu Yiming, Gao Limin, et al (0228)
- PDH frequency stabilization signal detection technology..... Hu Shuling, Geng Weibiao, Yuan Dandan, et al (0233)
- Measurement and study of 1,3-butadiene based on open path FTIR spectroscopy..... Tong Jingjing, Gao Minguang, Xu Liang, et al (0239)

❖ **Information processing** ❖

- Processing of backscattering signal of warship wake flow based on independent component analysis..... Wan Jun, Zhang Xiaohui, Rao Jionghui, et al (0244)
- Versatile restoration and experimental verification for multi-wave band image of object detection..... Hong Hanyu, Li Liangcheng, Zhang Xiuhua, et al (0251)
- Compressed sensing identification approach for avian with inverse synthetic aperture lidar..... Zhu Feng, Zhang Qun, Feng Youqian, et al (0256)
- Study on image registration of simultaneous imaging polarization system... Yang Changjiu, Li Shuang, Qiu Zhenwei, et al (0262)
- Parameter estimation of noise distribution model of EMCCD based on the expectation-maximization method..... Zou Pan, Liu Hui, Zhang Wenwen, et al (0268)
- Terra MODIS band 5th stripe noise detection and correction using MAP-based algorithm..... Wang Rongbin, Zen Chao, Jiang Wan, et al (0273)
- Line segment detection in low-SNR infrared image..... Ai Rui, Shi Zelin, Zhang Chengshuo (0278)