ISSN 1007-2276 http://www.irla.cn

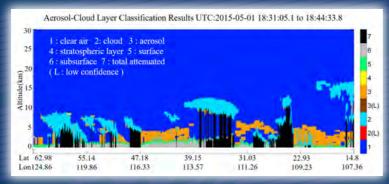
# 2017

Vol.46 No.12





INFRARED AND LASER ENGINEERING



# 本期特约报告

星载激光雷达CALIOP数据处理算法概述

刘东等

CALIOP作为目前最成功的星载云、气溶胶探测激光雷达,为研究全球环境和气候变化提供了大量的第一手数据资料。本文详细介绍了星载激光雷达CALIOP的系统结构、数据产品和反演算法,比较了不同版本算法之间的差异,并展望了未来我国星载激光雷达探测技术和反演方法的发展方向。 封面图片为CALIOP level 2场景识别和分类算法得到的气溶胶-云层次的时空分布信息。

中国航天科工集团公司 《红外与激光工程》编辑部

## 目 次

❖特约报告❖
星载激光雷达 CALIOP 数据处理算法概述
❖激光器技术❖
应用于高速平面激光诱导荧光的激光器研究
❖激光技术及应用❖
准分子激光皮肤治疗仪能量稳定性研究                        赵读亮,李文洁,梁 勖,等 1206001 激光选区熔化熔池光强监测系统设计       杜道中,刘婷婷,廖文和,等 1206002 纳秒脉冲控制精度对多光束组束的影响       石会财,曹劭文,张蓉竹,等 1206003 调频连续波激光引信探测系统设计       陈慧敏,刘伟博,顾 健,等 1206004 高斯光束整形非球面透镜的粒子群优化设计方法     张 爽,秦 华,杨 开,等 1206005 CdTe 和 CdTe/CdS 量子点的量子尺寸效应     常 存,高 莹,孔德贵,等 1206006
<b>❖</b> 红外技术及应用❖
高超声速拦截弹绕流红外辐射特性数值模拟 高铁锁,江 涛,丁明松,等 1204001 红外圆偏振透雾性能分析 曾祥伟,褚金奎,康维东 1204002 分子束外延 InAlSb 红外探测器光电性能的温度效应 陈 刚,李 墨,吕衍秋,等 1204003 多轨道准直式红外地球模拟器结构设计 陈启梦,张国玉,王 哲,等 1204004
<b>❖</b> 大气光学❖
折射率和粒子尺度对大气气溶胶光散射特性的影响
<b>❖</b> 光通信与光传感❖
室内可见光异步定位系统光学边界研究 陈颖聪,文尚胜,关伟鹏,等 1222001 高灵敏紫外激光脉冲能量在线检测系统设计 李文洁,赵读亮,林 颖,等 1222002 空间激光通信离轴两镜反射望远镜自由曲面光学天线设计 关 姝,王 超,佟首峰,等 1222003 无载波幅度相位调制无线光通信系统研究 柯熙政,李梦帆 1222004 基于菱形光纤布拉格光栅传感阵列的声发射定位技术 吕珊珊,耿湘宜,张法业,等 1222005
非视距紫外光通信系统中霾衰减特性研究(英文)

#### ❖光电测量❖

双绞式受抑全内反射无源光纤液位传感系统设计(英文) 张会新,冯丽爽 1217001
基于高速相关采样的锁模激光回波实时检测沈仲弢,封常青,高山山,等 1217002
基于子孔径波前振幅调制的斜率和曲率信号提取算法 王晓鹏,刘 克,李艳秋 1217003
四反射镜结构极坐标红外惯性稳像平台像旋研究(英文)
光子计数探测器响应函数标定及校正方法 许晓飞,张 丽,王 森 1217005
雷达辅助光电跟踪系统协同跟踪算法 王维佳,柏 鹏,梁晓龙,等 1217006
通道式偏振遥感器偏振解析方向测量误差分析及验证 范慧敏,裘桢炜,袁银麟,等 1217007
复杂深孔内轮廓结构光图像畸变矫正算法 丁 超,唐力伟,曹立军,等 1217008
玻璃面板油墨厚度无损在线数字化检测系统 周 林,杨甬英,闫 凯,等 1217009
❖先进光学材料❖
多壁碳纳米管薄膜在 THz 波段的传输与偏振特性 刘 鑫,王 玥,张丽颖,等 1221001
偏振不敏感的九聚物太赫兹超材料 刘 岩,范 飞,白晋军,等 1221002
❖光学设计及仿真❖
空间衍射望远镜自展开结构设计 左玉弟,金 光,李宗轩,等 1218001
天宫二号伴星可见光相机成像仿真方法 韩 意,陈 明,孙华燕,等 1218002
76 - 311 - 325 - 11 - 325 - 11 - 325 - 12 - 325 - 12 - 325 -
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计 李 响,张立中,姜会林 1218003
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计 李 响,张立中,姜会林 1218003
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计 李 响,张立中,姜会林 1218003 光学小卫星主载荷承力结构的多工况优化设计 谭陆洋,王 栋,李 林,等 1218004
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计 李 响,张立中,姜会林 1218003 光学小卫星主载荷承力结构的多工况优化设计 谭陆洋,王 栋,李 林,等 1218004 *光电器件与微系统*
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计       李 响,张立中,姜会林 1218003         光学小卫星主载荷承力结构的多工况优化设计       谭陆洋,王 栋,李 林,等 1218004         *光电器件与微系统*       石 柱,代 千,宋海智,等 1220001         X 射线光栅相衬成像的仿真(英文)       荣 锋,梁 莹,杨亚东,等 1220002
星载激光通信载荷高体分 SiC/Al 主镜及支撑结构设计 李 响,张立中,姜会林 1218003 光学小卫星主载荷承力结构的多工况优化设计 谭陆洋,王 栋,李 林,等 1218004 **光电器件与微系统* 低暗计数率 InGaAsP/InP 单光子雪崩二极管 石 柱,代 千,宋海智,等 1220001 X 射线光栅相衬成像的仿真(英文) 荣 锋,梁 莹,杨亚东,等 1220002 **信息获取与辨识*

## **Contents**

#### **❖** Invited paper ❖

Data processing algorithms of the space-borne lidar CALIOP: a review Liu Dong, Liu Qun, Bai Jian, et al. 1202001
❖ Laser technology ❖
Study on laser for applications in high-speed planar laser induced fluorescence
Li Xudong, Zhou Yiping, Yan Renpeng, et al. 1205001
Laser source used for measurement absolute spectral responsivity of long-wave infrared detectors
Packaging technique of Nd:YAG thin disk laser gain medium · · · · · Cao Liqiang, Lei Jun, Yu Yi, et al. 1205003
Design and optimization of 976 nm tapered semiconductor laser Sun Shengming, Fan Jie, Xu Li, et al. 1205004
<b>♦</b> Laser technology and application <b>♦</b>
Study on energy stability for excimer laser skin therapeutic apparatus Zhao Duliang, Li Wenjie, Liang Xu, et al. 1206001
Design of monitoring system of melt pool light intensity in selective laser melting
Effect of nanosecond pulse control precision on multi-beam beams
Design of FMCW laser fuze detecting system Chen Huimin, Liu Weibo, Gu Jian, et al. 1206004
Particle swarm optimization method for designing aspheric lens Gaussian beam shaping
Zhang Shuang, Qin Hua, Yang Kai, et al. 1206005
Quantum size effect of CdTe and CdTe/CdS quantum dots Chang Cun, Gao Ying, Kong Degui, et al. 1206006
❖ Infrared technology and application ❖
Numerical simulation of infrared radiation characteristics of flow over hypersonic interceptors
Gao Tiesuo, Jiang Tao, Ding Mingsong, et al. 1204001
Analysis on fogging performance of infrared circularly polarized light Zeng Xiangwei, Chu Jinkui, Kang Weidong 1204002
Temperature effect of InAlSb infrared detectors on photoelectric properties by molecular beam epitaxy
Structure design of multi-track collimating infrared earth simulator Chen Qimeng, Zhang Guoyu, Wang Zhe, et al. 1204004
* Atmospheric optics *
Effect of the refractive index and particle size parameter on light scattering properties of atmosphere aerosol
Particle size distribution and extinction characteristic analysis of marine atmospheric aerosol
Lu Xianyang, Li Xuebin, Qin Wubin, et al. 1211002
Numerical simulation and validation method of atmospheric turbulence of phase screen in rotation
Li Dun, Ning Yu, Wu Wuming, et al. 1211003
❖ Optical communication and optical sensing ❖
Research on optical boundary of indoor visible light asynchronous positioning system ·····
Design of highly sensitive on-line detecting system for ultraviolet pulse lasers energy
Li Wenjie, Zhao Duliang, Lin Ying, et al. 1222002
Optical antenna design of off-axis two-mirror reflective telescope with freeform surface for space laser communication
Guan Shu, Wang Chao, Tong Shoufeng, et, al. 1222003
Research on the carrierless amplitude and phase modulation wireless optical communication system

Acoustic emission location based on diamond FBG sensor array Lv Shanshan, Geng Xiangyi, Zhang Faye, et al. 1222005 Study on attenuation characteristics of NLOS ultraviolet communication system in haze
Li Chunyan, Gong Jiamin, Tang Qi, et al. 1222006
Analysis of influence of VLC system bias current on LED modulation bandwidth
* Photoelectric measurement *
Design of twisted-pair type of frustrated total internal reflection passive fiber-optic liquid level sense measurement system
Zhang Huixin, Feng Lishuang 1217001
Real-time detection of mode-locked laser echo signal based on high-speed correlation sampling
Shen Zhongtao, Feng Changqing, Gao Shanshan, et al. 1217002
Slope and curvature signal extraction algorithm based on subaperture wavefront amplitude modulation
Research on the image rotation of the polar coordinates infrared inertial stable platform with four reflected mirrors
Response function calibration and correction method for photon counting detector
Cooperative tracking algorithm of radar aided optic-electric tracking system
Measurement error analysis and validation of the angle of polarizer for channel-type polarization remote sensor
Fan Huimin, Qiu Zhenwei, Yuan Yinlin, et al. 1217007
Image distortion correction algorithm for complicated deep-hole profile using structured-light
Ding Chao, Tang Liwei, Cao Lijun, et al. 1217008
Nondestructive and on-line measurement system for the thickness of panel glass printing ink
❖ Advanced optical materials❖
Transmission and polarization properties of multi-walled carbon nanotubes film in terahertz waveband
Liu Xin, Wang Yue, Zhang Liying, et al. 1221001
Polarization-independent nonamer terahertz metamaterial Liu Yan, Fan Fei, Bai Jinjun, et al. 1221002
♦ Optical design and simulation ♦
Design of the spontaneous deployable structure for space diffractive telescope
Imaging simulation method of TG-02 accompanying satellite's visible camera
Han Yi, Chen Ming, Sun Huayan, et al. 1218002
Design of primary mirror and support structure of spaceborne laser communication terminal by the use of high-volume fraction
SiC/Al Li Xiang, Zhang Lizhong, Jiang Huilin 1218003
Multi-condition optimization design of main load bearing structure of optical small satellite
Tan Luyang, Wang Dong, Li Lin, et al. 1218004
♦ Photoelectric device and microsystem ♦
Low dark count rate InGaAsP/InP SPAD Shi Zhu, Dai Qian, Song Haizhi, et al. 1220001
Simulation of grating-based X-ray differential phase contrast imaging
<b>❖ Information acquisition and identification ❖</b>
Calibration and filtering of X-ray line array detector Geng Lei, Ma Xiao, Xiao Zhitao, et al. 1226001
Scene Information and processing \$
Hyperspectral image classification based on spatial–spectral structure preserving