光电工程

（Guangdian Gongcheng）

月刊　1974 年创刊

第 47 卷　第 3 期（总第 364 期）

2020 年 3 月

主管单位：中国科学院

主办单位：中国科学院光电技术研究所

中国光学学会

主　　编：罗先刚

编辑出版：《光电工程》编辑部

(四川省成都市双流区 350 信箱，邮编 610209)

电　　话：028-85100579

电子邮箱：oee@ioe.ac.cn

网　　址：http://www.oejournal.org

印　　刷：四川玖艺呈现印刷有限公司

国内发行：四川省报刊发行局

（邮发代号：62—296）

国外发行：中国国际图书贸易集团有限公司

（发行代号：M7114）

国内统一刊号：CN 51-1346/O4

国际标准刊号：ISSN 1003-501X

Opto-Electronic Engineering

(Monthly, since 1974)

Volume 47, Issue 3　　March　2020

Managed by

Chinese Academy of Sciences

Sponsored by

Institute of Optics and Electronics, Chinese Academy of Sciences

The Chinese Optical Society

Editor-in-Chief　Luo Xiangang

Edited and Published by

Editorial Office of *Opto-Electronic Engineering*, P. O. Box 350, Shuangliu, Chengdu 610209, P.R.China

Tel　+86-28-85100579

E-mail　oee@ioe.ac.cn

Website　http://www.oejournal.org

Printed by Sichuan Joy Art Printing Co., Ltd.

Domestic Distributed by

Sichuan Provincial Newspaper & Periodical Subscription and Distribution Bureau (Code: 62–296)

Overseas Distributed by

China International Book Trading Corporation (Code: M7114)

目　次

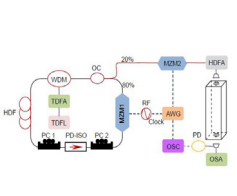
本期封面图片由西安理工大学张颖(190666)提供

扫描二维码，获取本期 PDF 全文

Opto-Electronic Engineering

Volume 47, Issue 3
March 2020
(Monthly, since 1974)

Contents

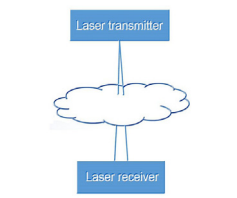


Propagation characteristics of 2.07 μm fiber laser in weak turbulence condition

190588

Lin Peng, Wang Tianshu, Ma Wanzhuo, Chen Junda, Jiang Huilin

An actively mode-locked holmium-doped fiber laser with a central wavelength of 2.07 μm was demonstrated, and the propagation characteristics under weak turbulent condition were analyzed. A segment of 1.5 m holmium-doped fiber was used as gain medium.

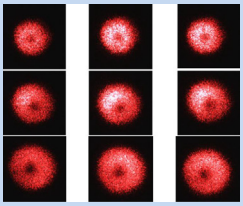


Analysis of the effect of cloud thickness on the performance of blue-green laser communication

190389

Li Songlang, Mao Zhongyang, Liu Chuanhui, Liu Min

When the airborne laser transmitter is located above or in the center of the cloud, the laser communication performance will be reduced. In order to solve this problem, the effects of different types of clouds on laser energy attenuation, SNR, maximum symbol transmission rate and bit error rate were simulated and analyzed.

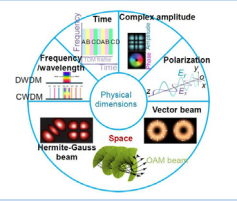


Field distribution characteristics of vortex beams passing through the non-Gaussian random rough surface

190477

Lv Hong, Ren Chengcheng, Liu Xudong, Dang Lei

Based on the theory of angular spectrum representation, the non-Gaussian rough surface was simulated by Johnson transfer system, and the field distribution characteristics of Laguerre-Gaussian vortex beams passing through the random non-Gaussian rough surface were studied.

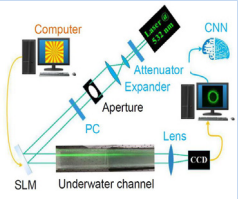


Research advances of orbital angular momentum based optical communication technology

190593

Guo Zhongyi, Gong Chaofan, Liu Hongjun, Li Jingjing, Wang Zikun, Yang Yang, Gong Yubin

Based on the basic concepts and theories of OAM beam types and their generation methods, a brief overview of typical research cases related to the application mechanisms of these two communication systems was given. Three key technologies were discussed.

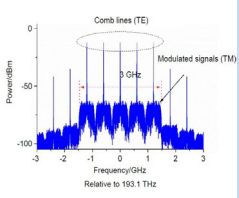


Research progress of orbital angular momentum modes detecting technology based on machine learning

190584

Yin Xiaoli, Cui Xiaozhou, Chang Huan, Zhang Zhaoyuan, Su Yuanzhi, Zheng Tong

The OAM modes detecting schemes based on ML technology were reviewed, including error BP neural networks, SOM, SVM, CNN, mode recognition techniques base on beam transformations and all-optics D2NN. The performance, advantages and obstacles of each kind of the neural networks in atmosphere and underwater channels were analyzed.

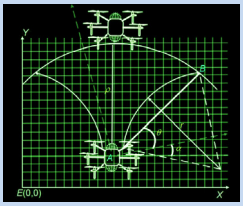


An ultra-wideband microwave photonic channelized receiver with zero-IF architecture

190650

Chen Bo, Wang Mingjun, Gao Yongsheng

A zero-IF receiver based on microwave photonic was proposed. The center frequency of the optical frequency comb can be adjusted to correspond to the center frequency of the wideband RF signal group.

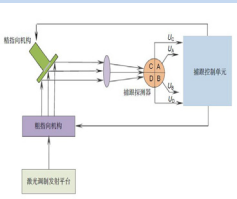


An algorithm for the bee colony drone to use wireless ultraviolet for cooperative obstacle avoidance

190505

Zhao Taifei, Gao Peng, Shi Haiquan, Li Xingshan

An algorithm for collaborative avoidance using wireless ultraviolet light between drones in a bee colony drone formation was proposed. Combined with this algorithm and using the characteristics of wireless ultraviolet light coverage, the avoidance strategy of ultraviolet virtual fence was designed.



Research on acquisition and tracking technology for the four-quadrant detector

190559

Lu Qian, Ren Bin, Bian Jingying

Aiming at the space laser communication system requirement of miniaturization, a scheme of using the four-quadrant detector to complete the acquisition and tracking was proposed. The feasibility of the scheme was verified, and a foundation for the miniaturization design of the laser terminal was laid.