

# 光电工程



## Opto-Electronic Engineering

2019年 第46卷 第3期

新一代光存储 ——  
更新传统存储观念  
确保数据财富久安

超50年数据保存寿命



TB/inch<sup>2</sup>级存储密度



10 GB/s级数据传输速度



中国科学院光电技术研究所

万方数据



中国光学学会

# 光电工程 (Guangdian Gongcheng)

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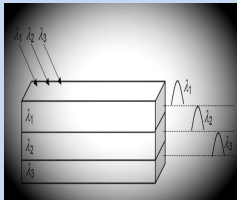
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大学林泉(180642)提供



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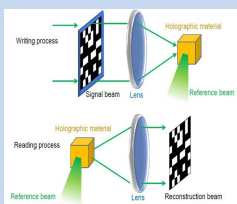
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### Review



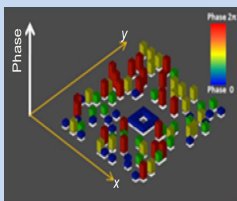
- Development status and prospect of optical storage technology** 180560  
Su Wenjing, Hu Qiao, Zhao Miao, Yuan Xupeng, Guo Xinjun, Ruan Hao

The development history of optical storage technology was briefly introduced. Eight types of optical storage technologies with industrial prospects were listed in detail. Then their principles and development status were summarized, and their technical features and prospects as Big Data storage media were discussed.



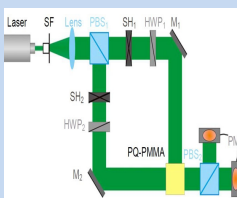
- Optical holographic data storage—The time for new development** 180642  
Lin Xiao, Hao Jianying, Zheng Mingjie, Dai Tianguai, Li Hui, Ren Yuhong

With the continuous development of key devices and materials, optical holographic data storage technology is becoming more and more mature. The development of optical holographic data storage technology in the past 50 years was reviewed in this paper.



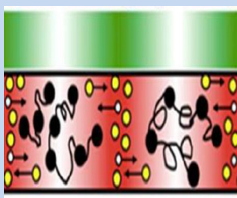
- Phase modulated collinear holographic storage** 180596  
Liu Jinpeng, Xu Ke, Liu Jinyan, Cai Jianyong, He Youwu, Tan Xiaodi

The principle, system structure and coding method of the collinear holographic data storage system were introduced and analyzed. Moreover, a multilevel complex amplitude modulated collinear holographic storage system was evaluated.



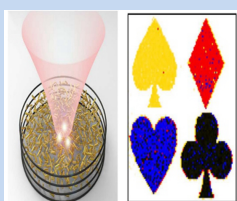
- Review on polarization holography for high density storage** 180598  
Wei Ran, Zang Jinliang, Liu Ying, Fan Fenglan, Huang Zhiyun, Zhu Lili, Tan Xiaodi

The development of polarization holography, the tensor-based holographic theory and some of its inferences were introduced. Then the further applications of polarization holography in high density data storage were briefly overviewed.



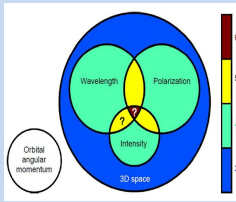
- A review of photopolymers on holography volume data storage** 180552  
Jian Jialing, Cao Lin, Wei Xiqiao, Guo Jinxin, Wang Dayong, Zhang Xinpeng

Volume holographic storage technology has the advantages of high storage density, huge data capacity, parallel read and write, fast transmission speed and so forth. The excellent performance of photopolymer applied on volume holographic storage was introduced.



- Encoding disorder gold nanorods for multi-dimensional optical data storage** 180584  
Ouyang Xu, Xu Yi, Xian Mingcong, Cao Yaoyu, Dai Qiaofeng, Li Xiangping, Lan Sheng

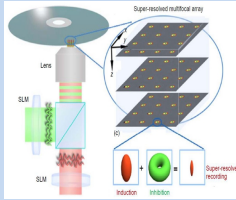
The recent progresses about five-dimensional optical data storage and multilevel storage utilizing disorder gold nanorod from the structured matter point of view and super resolution storage from the structured light point of view were reviewed, respectively.



**Dimension expansion of high-capacity optical data storage**  
Chen Weiliang, Zhang Jingyu

180571

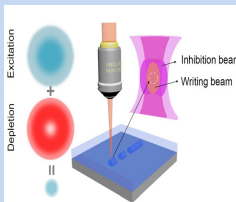
Techniques employed various multiplex dimensions such as 3D space, polarization and wavelength were briefly introduced. Especially, the development history, current state of the art and urgent challenges of five-dimensional optical data storage based on laser-induced nanogratings were highlighted.



**Research progress of super-resolution optical data storage**  
Jiang Meiling, Zhang Mingsi, Li Xiangping, Cao Yaoyu

180649

The principle of optical storage techniques beyond diffraction-limited and recent progress in high capacity optical data storage, including far field super-resolution three dimensional optical (3D) storage techniques and near field super-resolution two dimensional (2D) optical storage techniques were presented.



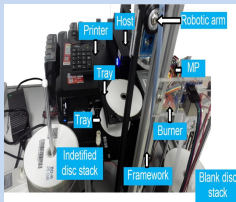
**Industrialization oriented technology of dual-beam super-resolution data storage**

180559

Luo Zhijun, Liu Yanan, Chen Menglin, Deng Lin, Gan Zongsong

The key problems in the industrialization of dual-beam super-resolution optical data storage technology were illuminated, and some basic solutions to these obstacles were discussed.

**Article**



**An integrated cyber-physical system for automatic identification of massive discs**

180561

Yao Jie, Zhang Yifan, Cao Qiang, Xie Changsheng

A batch-disc automatic identification system was designed, which integrates common optical disc recorders, printers, and cameras, automatically to print physical label and to burn logical identification on each disc.

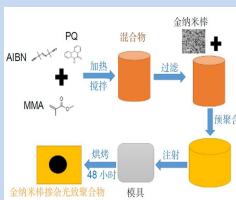


**Error correction methodology based on redundant recovery code for optical storage system**

180557

Zheng Mu, Luo Tiewei

In order to improve the reliability of optical storage data, an error correction methodology in optical storage system was proposed. It is based on redundant recovery code technology, which relates to the field of optical disc data storage.

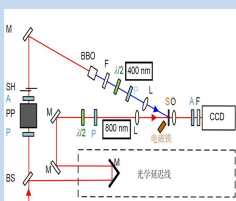


**Monitoring and optimization of the synthesis process of the holographic doped photopolymers**

180620

Cao Liangcai, Wu Shenghan, He Zehao, Li Yaoyao, Jin Guofan

A method for quantitatively monitoring and optimization of the synthesis process of doped photopolymers by absorption spectrum was presented. It brings new possibility to quantitative optimization in the preparation process of doped photopolymers.



**Microscopic three-temperature model for all-optical switching in GdFeCo**

180629

Yao Han, Wang Sicong, Wei Chen, Cao Yaoyu, Li Xiangping

By using this M3TM, the AOS dynamics and the final magnetization states of GdFeCo induced by single laser pulses with different energy and pulse widths were calculated and analyzed concretely.