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DYNAMICALLY TUNABLE COLOR DISPLAY BASED ON ANISOTROPIC PLASMONIC METAMIRROR

A novel dynamically tunable color filter technology provides highly secure information encryption and multiplexing of distinguishable images using cheap, scalable manufacturing for applications like security tagging and high-density data storage.

Plasmonic nanostructures have been used recently to scatter light of different colors depending on their geometry and composition. Plasmonic color filters are becoming popular because they have a high resolution, are environmentally friendly, and are mechanically/chemically robust. The rapid development in the area of data storage and security calls for extra tuning parameters to increase levels of information states.

Researchers at Purdue University have developed a dynamically tunable color filter based on a wavelength-dependent optical rotation effect. This technology can be designed for highly secure information encryption. Careful arrangement of differently oriented nanoantennas can be used to further increase the encoded information states and achieve highly secure encryption. This technology is better than existing solutions due to its capability of multiplexing highly distinguishable images with a single device, offering cheap and scalable manufacturing, high purity color generation, and high tolerance to viewing angles.

Advantages:

-Highly distinguishable images with single device

-Cheap, scalable device manufacturing

-Nontoxic and environmentally friendly

-High purity color generation

Potential Applications:

Technology ID

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Category

Materials Science & Nanotechnology/Nanomaterials & Nanostructures

Computing/Photonic & Optical Computing Technologies

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View online

-Active color displays

-High-density optical data storage

-Security tagging

-Cryptography

TRL: 3

Intellectual Property:

Provisional-Patent, 2018-05-17, United States | Utility Patent, 2019-05-13, United States | CON-Gov. Funding, 2021-04-07, United States

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