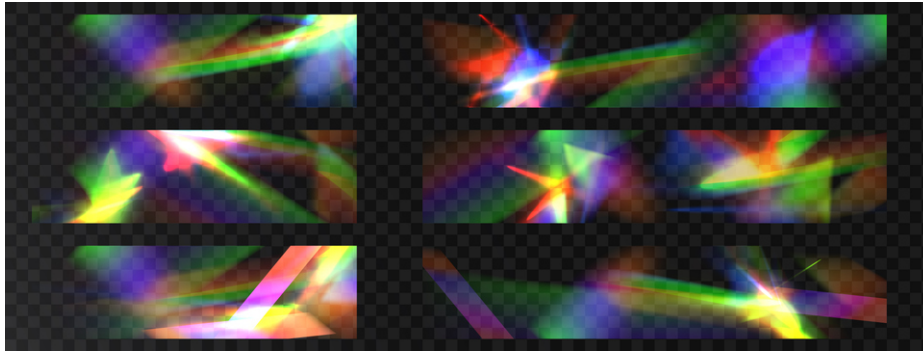




Angle-Insensitive Spectrum Filters

Technology Number: 5692



Technology ID

5692

Category

Hardware

Engineering & Physical Sciences

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OVERVIEW

Angle-insensitive nanostructured color filters for enhanced display and imaging systems

- Improves color efficiency, resolution, and power consumption in wider viewing angles
- Applications in LCD displays, 3D projection systems, e-books, anti-counterfeiting

BACKGROUND

Traditional display technologies rely on colorant-based pigmentation to produce colors, which tend to suffer from inefficiencies, high power consumption, and bulkier dimensions. Efforts to improve these displays with photonic and plasmonic crystal based structures as replacements for colorant-based pigmentation allow increased efficiencies, lower power consumptions, slimmer dimensions, and enhanced resolution but suffer from incident angle dependency. The need for better display technologies has grown with the demand for higher resolution, more power-efficient screens in consumer electronics, and specialty applications such as 3D projection and e-books. Hence, there is a demand for angle-insensitive high-efficiency spectrum filtering to overcome these limitations.

INNOVATION

Researchers at the University of Michigan have developed advanced angle-insensitive color filters using plasmonic nanostructures for both reflective and transmission formats. This technology utilizes the light-capturing capabilities of nanoresonators and grating structures to maintain consistent color filtering across a wide range of incident angles, up to $\pm 80^\circ$. By funneling light into arrayed photonic resonators, the technology achieves higher transmission efficiency, low power consumption, and enhanced resolution. These filters can be integrated

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into LCD screens, 3D projection systems, and e-books, offering a slimmer design and more vibrant, long-lasting colors.

ADDITIONAL INFORMATION

[US9547107](#) "Dye and pigment-free structural colors and angle-insensitive spectrum filters"