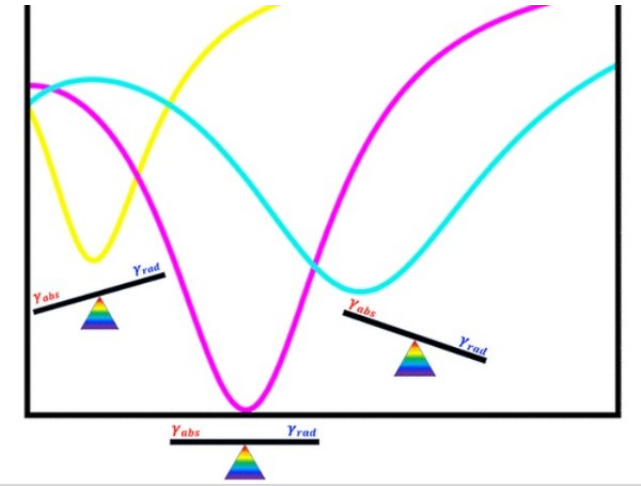
INNOVATION PARTNERSHIPS
UNIVERSITY OF MICHIGAN

High-index/Low-index/Absorber Structure for Vivid Color Generation

TECHNOLOGY NUMBER: 2023-511



Technology ID
2023-511

Category
Hardware
Engineering & Physical Sciences

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OVERVIEW

Vivid structural colors through spectral analysis and tri-layer structure

- Maximizes chromatic performance with minimal structural complexity
- Automotive paints, fashion textiles, and eco-friendly pigments

BACKGROUND

The advancement of structural color technologies has historic roots in achieving minimally complex, high-intensive chromatic solutions, often hindered by computational demands for multi-layer designing. Typical methods involve aligning optical wavelengths, yet competition in material durability and simplicity remains fierce. Traditional manufacturing falls short in responding to sustainability concerns while delivering consistent color brightness. New predictive models are crucial to address these limitations, enabling tailored material solutions with reliable and repeatable outcomes across industries demanding vibrant colors in environmentally-responsible ways.

INNOVATION

Researchers at the University of Michigan have developed a new analytical method, harnessing temporal coupled mode theory to streamline chromatic prediction and achieve unmatched

vibrant colors with layered structures. The approach differentiates by maximizing absorptive and radiative balance within simplified tri-layer configurations, eliminating dependencies on complex material dispersions. As applications broaden from fashion to displays, the model promises substantial economic and strategic impact by minimizing production overheads and emphasizing more sustainable practices. This results in a pivotal step in the progression of structural color technology.

ADDITIONAL INFORMATION

REFERENCES

Temporal Coupled Mode Analysis of Chromaticity in Trilayer Subtractive Structural Colors, Wei-Jie Feng, Yian Cheng, and L. Jay Guo, ACS Photonics 2023 10 (8), 2784-2792, DOI: 10.1021/acsphotonics.3c00481

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