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Realization of a perfect light absorber in two-dimensional homobilayer by reducing interlayer interaction

Nanofabrication approaches for realizing perfect light absorbance in two-dimensional homobilayer materials

IP Status: Provisional Patent Application Filed

Applications

- Secure optical communications
- Photodetectors
- Photovoltaics
- Stealth materials

Technology Overview

Near-perfect light absorbers (NPLA) with absorbance of at least 99%, have a wide range of applications ranging from energy and sensing devices to stealth technologies and secure communications. Current approaches for fabricating NPLAs require complex and expensive nanofabrication approaches. Researchers at the University of Minnesota have developed multiple nanofabrication approaches that rely on straightforward fabrication approaches to significantly decrease the complexity and cost of fabricating NPLAs. This is accomplished with a simple single mirror cavity structure using a two-dimensional homobilayer with reduced interlayer interaction either by introducing a twist angle or inserting a buffer layer.

Phase of Development

TRL: 2-3
Proof-of-concept

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

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Press Releases

UMN College of Science & Engineering Research Brief 8/1/2023

Researchers

- Tony Low, PhD Professor, Department of Electrical and Computer Engineering
- Steven Koester, PhD Professor, Department of Electrical and Computer Engineering

Technology ID
2023-007

Category
All Technologies
Engineering & Physical Sciences/Design Specifications
Engineering & Physical Sciences/Nanotechnology
Engineering & Physical Sciences/Photonics
Engineering & Physical Sciences/Semiconductor

Learn more

References

1. Seungjun Lee, Dongjea Seo, Sang Hyun Park, Nezhueytl Izquierdo, Eng Hock Lee, Rehan Younas, Guanyu Zhou, Milan Palei, Anthony J. Hoffman, Min Seok Jang, Christopher L. Hinkle, Steven J. Koester, Tony Low(2023) , https://www.nature.com/articles/s41467-023-39450-0, https://www.nature.com/ncomms/, 14, 3889