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Conference Paper

A Study on Absorptance Enhancement of Multilayer Graphene Metamaterial in Terahertz Regime

November 2022

DOI:[10.1109/EDKCON56221.2022.10032831](#)

Conference: 2022 IEEE International Conference of Electron Devices Society Kolkata Chapter (EDKCON)

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

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Based on graphene tunable dual-band terahertz metamaterial absorber with wide-angle

May 2018 · Optics Communications

Mulin Huang ·  Yongzhi Cheng · Zhengze Cheng · [...] · Rongzhou Gong

We present a wide-angle tunable dual-band terahertz (THz) metamaterial absorber (MMA) based on square graphene patch (SGP). This MMA is a simple periodic array, consisting of a dielectric substrate sandwiched with the SGP and a continuous metallic film. The designed MMA can achieve dual-band absorption by exciting fundamental and second higher-order resonance modes on SGP. The numerical ... [\[Show full abstract\]](#)



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Full 360° Terahertz Dynamic Phase Modulation Based on Doubly Resonant Graphene-Metal Hybrid Metasurf...

October 2021

Binxu Wang ·  小青 Luo · Yalin Lu ·  Guangyuan Li

Dynamic phase modulation is vital for tunable focusing, beaming, polarization conversion and holography. However, it remains challenging to achieve full 360° dynamic phase modulation while maintaining high reflectance or transmittance based on metamaterials or metasurfaces in the terahertz regime. Here we propose a doubly resonant graphene-metal hybrid metasurface to address this challenge. ... [\[Show full abstract\]](#)

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Designing miniaturized metamaterial absorber with tunable multiband characteristics for THz applicat...

December 2021 · Bulletin of Materials Science

Balu Ashvanth · B. Partibane · Govindanarayanan Idayachandran

In this paper, a novel tunable metamaterial absorber having multiple bands is presented for solving sensing-related issues in THz applications. Initially, a zigzag shaped metamaterial absorber with multiband response is reported and then, a tunable absorber is proposed to cover a wide THz spectrum. The proposed tunable absorber has six 'V' shaped stubs with graphene at the edges to realize six ... [\[Show full abstract\]](#)

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A polarization-independent terahertz plasmon-induced transparency metamaterial based on hybrid graph...

August 2015 · Journal of Modern Optics

 Xiaolei Zhao ·  Cai Yuan · Wenhua Lv · [...] ·  J. Q. Yao

A polarization-independent terahertz metamaterial based on hybrid graphene-gold structure with excellent refractive index sensing characteristics is proposed. The proposed structure exhibits a sharply narrow plasmon-induced transparency peak in the transmission spectrum at the terahertz regime. Obvious frequency shift in the transparency peak can be observed by varying the surrounding medium's ... [\[Show full abstract\]](#)


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Graphene plasmonics: Physics and potential applications

October 2016 · Nanophotonics



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Shenyang Huang · Song Chaoyu · Guowei Zhang · Steve Yan

Plasmon in graphene possesses many unique properties. It originates from the collective motion of massless Dirac fermions and the carrier density dependence is distinctively different from conventional plasmons. In addition, graphene plasmon is highly tunable and shows strong energy confinement capability. Most intriguing, as an atom-thin layer, graphene and its plasmon are very sensitive to the ... [\[Show full abstract\]](#)

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Reconfigurable Graphene-Based Metamaterial Polarization Converter for Terahertz Applications

January 2022

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This paper suggests a high gain polarization converter using a graphene-based metamaterial array. The graphene-based metamaterial polarization converter is a rectangular array that consists of 20 periodic unit-cell elements. Each graphene-based metamaterial unit-cell element consists of a rectangular patch with four triangular-shaped graphene parts at its four corners. The rectangular patch with ... [\[Show full abstract\]](#)

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Electrically Controllable Molecularization of Terahertz Meta-Atoms

June 2018 · Advanced Materials

Hyunseung Jung · Jaemok Koo · Eunah Heo · [...] · Hojin Lee

Active control of metamaterial properties is critical for advanced terahertz (THz) applications. However, the tunability of THz properties, such as the resonance frequency and phase of the wave, remains challenging. Here, a new device design is provided for extensively tuning the resonance properties of THz metamaterials. Unlike previous approaches, the design is intended to control the ... [\[Show full abstract\]](#)

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Tunable THz generation and enhanced nonlinear effects with active and passive graphene hyperbolic me...

March 2020

Boyuan Jin · Tianjing Guo · Liang Zhu · [...] · Christos Argyropoulos

The active and nonlinear graphene properties are limited due to weak light matter interaction between the ultrathin graphene and the incident light. In this work, we present enhanced nonlinear effects at the low terahertz (THz) range by designing a new patterned graphene hyperbolic metamaterial (GHMM). More specifically, it is demonstrated that the third harmonic generation (THG) can be ... [\[Show full abstract\]](#)

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Plasmon induced transparency in graphene based terahertz metamaterials

November 2017 · EPL (Europhysics Letters)

Amarendra Kumar Sarma · Koijam Monika Devi · Maidul Islam · [...] · Gagan Kumar

Plasmon induced transparency (PIT) effect in a terahertz graphene metamaterial is numerically and theoretically analyzed. The proposed metamaterial comprises of a pair of graphene split ring resonators placed alternately on both sides of a graphene strip of nanometer scale. The PIT effect in the graphene metamaterial is studied for different vertical and horizontal configurations. Our results ... [\[Show full abstract\]](#)

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Electrically controlling the polarizing direction of a graphene polarizer

September 2014 · Journal of Applied Physics

 Chu Cai Guo ·  Z. H. Zhu ·  Keyao Liu · [...] ·  Qin Shiqiao


We theoretically demonstrate a polarizer with an electrically controllable polarizing direction in the far infrared range using two orthogonal periodic arrays of graphene ribbons, which have different widths and are supported on a dielectric film placed on a thick piece of metal. The operation mechanism originates from the polarization-dependent resonant absorption of the two orthogonal graphene ... [\[Show full abstract\]](#)

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Graphene hyperbolic metamaterials: Fundamentals and applications

October 2022 · EPL (Europhysics Letters)

Zitao Ji · Zhi Yuan Li ·  Wenyao Liang

Metamaterials have shown potential for next generation optical materials since they have special electromagnetic responses which cannot be obtained in natural media. Among various metamaterials, hyperbolic metamaterials (HMMs) with highly anisotropic hyperbolic dispersion provide new ways to manipulate electromagnetic waves. Besides, graphene has attracted lots of attention since it possesses ... [\[Show full abstract\]](#)

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Reflection modulation properties at two frequencies of dual-control graphene metamaterial terahertz...

January 2016

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