

عنوان مقاله:

Graphene-based triple-band with angle-polarization-tolerance-insensitive and adjustable terahertz metamaterial perfect absorber based on the graphene structure

محل انتشار:

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خلاصه مقاله:

In this survey, a graphene-based design of a three-band metamaterial perfect absorber (MPA) is theoretically investigated. The absorber is composed of the periodically placed square- and circle-shaped graphene array on the top of a copper layer as a conductive substrate separated by a thick SiO₂ dielectric spacer. The proposed structure has three absorption peaks of ۹۹.۹۴%, ۹۶.۵۴%, and ۹۹.۸۷% at the central wavelength of ۳۷۰۸۰ nm, ۳۹۳۸۹ nm, and ۴۶۲۲۱ nm respectively. During this study, we investigate the adjustability of the structure with changes in the level of Fermi graphene (μ c) and insensitivity to polarization and impact angle. Results indicate that the structure is adjustable and sensitive to the incident angle. In addition, the proposed absorber is a polarization-insensitive structure. Also, minor changes in dimensions of the structure design lead to shifting in the absorption frequency in infrared frequencies. Subsequently, findings demonstrate that the structure is adjustable and sensitive to the angle of impact and the proposed adsorbent is a non-polarizing structure. All of these features make the spectrum infrared absorber suitable for imaging and filtering applications and Infrared thermal-imaging cameras are used to detect heat loss in insulated systems, to observe changing blood flow in the skin, and to detect the overheating of electrical components. Furthermore, we investigate electric fields in order to show how the absorption structure mechanism is working. The paper includes tables that provide statistics on the bandwidth of absorption peaks as a means to make it comparable with other similar structures.

کلمات کلیدی:

.Triple-band, Graphene, Adjustable, Polarization insensitive, Metamaterial perfect absorber, Terahertz

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