

[Home](#) > [Plasmonics](#) > Article

Graphene-Based Highly Efficient Surface Plasmon Resonance Solar Absorber Design Using Zr-GaAs-Cr Materials for Renewable Energy Generation

| RESEARCH | Published: 11 November 2024

| (2024) [Cite this article](#)**Plasmonics**[Aims and scope](#) →[Submit manuscript](#) →

[Khaled Aliqab](#), [Bo Bo Han](#), [Adhavan Balashanmugham](#), [Shobhit K. Patel](#), [Ammar Armghan](#) ✉ & [Meshari Alsharari](#) ✉

38 Accesses [Explore all metrics](#) →

Abstract

Investigating the new solar absorber under the study of photonics devices stands an important role in many energy harvesting processes. To suppose the thermal energy system with many applications in actual works, the recent absorber is created by combining the material properties (Zr-GaAs-Cr) and additional graphene effect can pick up the high absorption rate of 94.72% in a large bandwidth of 2800 nm. The current Zr resonance layer is composed with the unique shapes of two blocks and one semi-ring to form a 'U' shape, and an interior circle is constructed inside of the U shape. The current work can solve thermal system applications of energy transfer, temperature controlling, heating and cooling systems in buildings, electricity production, and industrial processes.