

Optoelectronic Devices Based on Graphene-Like Materials and their Related Heterostructures

Abstract

Graphene is a wonderful material thanks to its peculiar electronic, optical, thermal, and mechanical properties. In the past decade or so, advances in graphene-based devices have been evidently demonstrated, which shed light on the potential applications from visible to terahertz (THz) light waves. In order to enhance the performance of conventional graphene-based optoelectronic devices confined by the limited length of light-matter interaction on a nanometer scale, we develop the novel design and fabrication of high-performance graphene-based optoelectronic devices (particularly, photodetectors (from visible to the near-infrared regions) and THz modulators), by utilizing the extraordinary electronic and optical properties of graphene and its intrinsic transition characteristics. Similar strategies are applicable to other two-dimensional transition metal dichalcogenides (TMDs) and the related heterostructures.

References

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Figures

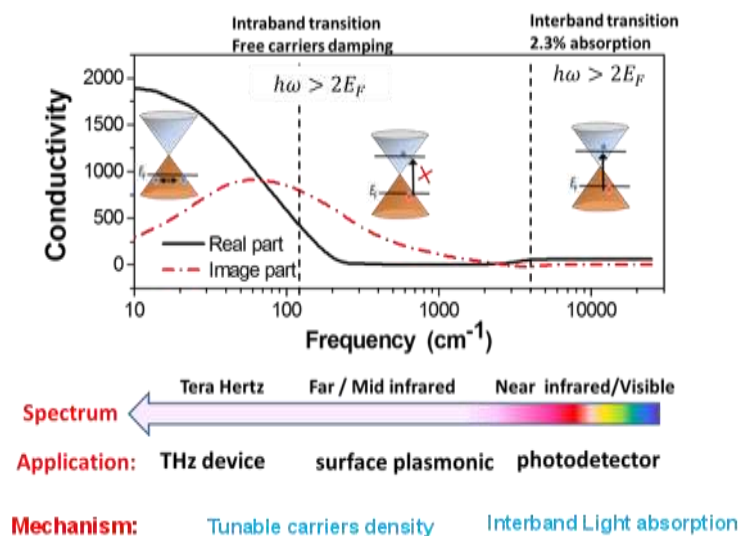


Figure 1: The conductivity of graphene in a broad spectral range.