Nanoantenna with graphene rectangular patch

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Abstract

The interest in ever smaller devices operating at high frequencies has been greater as the years go by [1]. Graphene has an electrical capacity for miniature antennas and suitable for wireless communication in nanosystems [2].In this context, a numerical analysis of nanoantennas with rectangular graphene patch in the terahertz band was performed (Figure 1a). The electromagnetic dispersion of these planar structures was modeled using the commercial software CST STUDIO SUITE that uses Finite Integral Method. Nanoantenna analysis was performed based on different values of chemical potentials. The conductivity for any frequencies values is show in the Figure 1b. After the modeling, we verified that the graphene nanoantenna showed that the resonant response showed good stability with temperature, but with sensitivity in relation to the size of the graphene patch and the variation of the chemical potential value, causing a frequency shift from the point of resonance of the nanoantena. The modeling as well as the simulations performed in this study are useful for designing nanoantennas that can operate in the terahertz band.
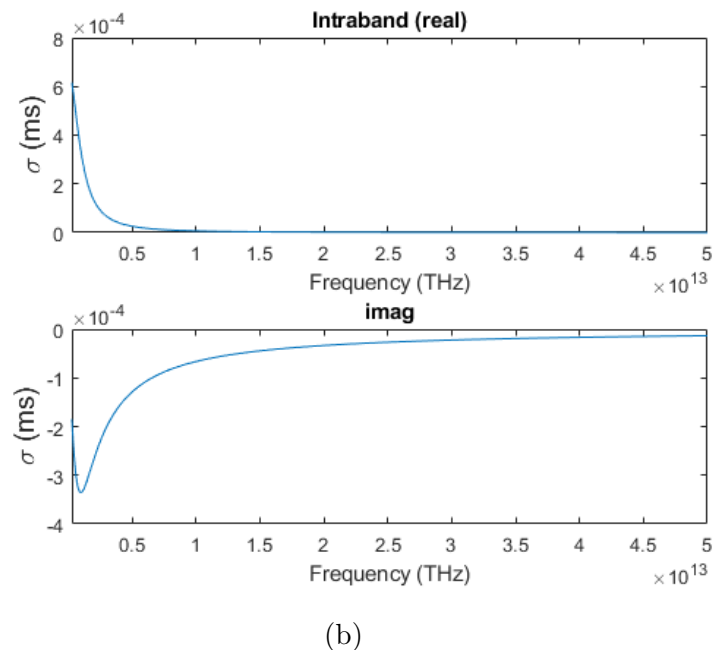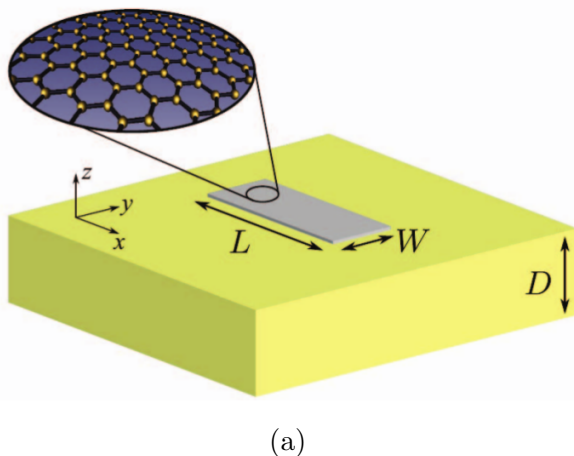
Figure 1: (a) Schematic diagram of a graphene based nanoantenna and (b)Graphene Conductivity.

1 References

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