Optical Properties of Dielectric-Graphene Left Hand Material Structure

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ABSTRACT

It is well known the remarkable optical properties of both graphene and left handed materials, for which we study the optical properties of a multilayer system building by graphene-dielectric-left hand material. In this work, we show the transmission, reflection and absorption spectra for a different set of parameters of the left-handed material structure. It is important to highlight that the inclusion of graphene remarkably modifies the transmission and absorption spectra. The optical properties of the graphene-LHM can be modulated via the different parameters of system. We showed that the fill function do not change the line form of the spectra, however, modify their amplitudes. With respect to light polarization, it's possible to observe that the spectra are widen for TM respect to TE polarization.

INTRODUCTION:

It is well known from a simple approach that the refractive index is a function of the rate of the velocity of light in matter to vacuum. The electromagnetic theory predicts that the speed of light in a medium, is a function of the electric permittivity and the magnetic permeability functions of such medium. Historically the refractive index was treated as a positive quantity until 1968 when Victor G. Veselago published a theoretical work [1] where a hypothetical material possess the property to have a negative refractive index. Veselago proposed that the permittivity and the permeability are complex functions of the frequency and whose both real part are negative and both