

Numerical investigation of transmission of graphene based one-dimensional photonic band-gap structure

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In this study, a transmission property of one-dimensional photonic band-gap (1D-PBG) structure consisting of two periodically alternated dielectric layers, which the first layer is ordinary dielectric material and the second layer is dielectric material containing graphene multilayer system inside the layer, have been numerically investigated by using transfer matrix method. The numerical results give the transmission spectrum for both transverse electric (TE) and transverse magnetic (TM) polarization and also show that the position of photonics band-gap locating in terahertz (THz) region. In addition, we exploit that the width of band-gap can be tuned by the properties of graphene layer. Finally, the proposed graphene based 1D-PBG structure can be designed as an efficient passive filter for electromagnetic wave in THz wavelength region.

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