

Investigation of photonic band gap of one-dimensional heterostructure magnetic photonic crystals

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Multiple structures in one-dimensional (1D) photonic crystals (PCs) have great potentials for ultrawide omnireflectors and controllable switches. Here, we study the propagation of electromagnetic waves in a magnetic superlattice heterostructure as a 1D heterostructure magnetic photonic crystal (HMPC). These structures consist of alternating layers with magnetic permeabilities μ_1 and μ_2 with double periods (Λ_1 and Λ_2). Photonic band gap (PBG) for both TE and TM polarizations of electromagnetic waves propagation through the HMPC has been studied by means of the transfer matrix method. Regarding the calculated PBG of the system, ideas for switching and filtering applications are discussed in the paper. Controllable magnetophotonic devices can be designed with respect to the PBG of the HMPC.

← 13.4 cm →

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9.7 cm