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Comparative study of density of states of 1D photonic crystal for different polarization conditions of incident wave

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Abstract

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In this paper, a comparative analysis is made for density of states profile of one-dimensional infinite photonic crystal under the incidence of electromagnetic wave with different polarizations (p- type and s-type). Semiconductor heterostructure is considered as the material for the periodic arrangement, and structural parameters are suitably varied to observe the effect on DOS function, characterized by blueshift and redshift. Adachi's model is considered to incorporate the dependencies of refractive indices on operative wavelength and material composition. Results are plotted with normalized wavelength. Positions of peaks speak about the possible emission/detection wavelength for photonic crystal based laser. Analysis is useful in designing optical memory and micro-laser devices.

Published in:

Electronics, Communication and Instrumentation (ICECI), 2014 International Conference on

Date of Conference:

16-17 Jan. 2014

Page(s):

1 - 4

Print ISBN:

978-1-4799-3982-4

INSPEC Accession Number:

14162008

Conference Location :

Kolkata

DOI:

10.1109/ICECI.2014.6767359

Publisher:

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