

Hydrostatic pressure and temperature dependence of the band structure in a 1-D semiconductor photonic crystal

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Resumo

The band structure of a one-dimensional photonic superlattice composed of alternate layers of air and GaAs characterized by different refractive indexes have been theoretically investigated using a transfer matrix technique. In addition to the well known existence of the band gaps, we show that the band gaps depends on the width relationship between the layers materials, also, we have found that the temperature dependence of the photonic band structure is negligible, however its main changes are due to the variations of the width and the dielectric constant of the layers of GaAs, caused by the applied hydrostatic pressure.