Abstract

Photonic Crystal Slab

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A theoretical study is presented of the electromagnetic modes of a photonic crystal slab. The system is composed of an infinite slab of a finite uniform thickness. The slab is made up of a periodic array of dielectric cylinders and exhibits periodic behavior in the planes of the slab surfaces. The slab is free standing and embedded in a uniform isotropic background medium. Results are presented for the dispersion relations, modal wavefunctions, and the density of states for parameters based on experimentally realizable systems. The dependence of these properties on slab thickness is determined.