

Optimization of Resonances in Photonic Crystal Slabs

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ABSTRACT

Variational methods are applied to the design of a two-dimensional lossless photonic crystal slab to optimize resonant scattering phenomena. The method is based on varying properties of the transmission coefficient that are connected to resonant behavior. Numerical studies are based on boundary-integral methods for crystals consisting of multiple scatterers. We present an example in which we modify a photonic crystal consisting of an array of dielectric rods in air so that a weak transmission anomaly is transformed into a sharp resonance.

Keywords: photonic crystal, resonance, optimization, transmission

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