

Angle- and Thickness-Dependent Photonic Band Structure in a Superconducting Photonic Crystal

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Abstract

The angle- and thickness-dependent photonic band structures in a one-dimensional superconducting photonic crystal are theoretically investigated based on the transfer matrix method. The band structure is studied near and below the threshold frequency at which the superconducting material has a zero permittivity. The gap structure is analyzed as a function of the thicknesses of the two constituent superconducting and dielectric materials. In the angular dependence of the band structure, it is found that in the TM-polarization there exists a strongly localized superpolariton gap in the vicinity of the threshold frequency. This gap is shown to be enhanced as the angle increases.

Keyword : Superconducting photonic crystal · Photonic