Abstract

Large Nonlinear Optical Response of Photonic Microcavity Arrays

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An array of microcavities in a photonic bandgap lattice allows a large increase in the third-order nonlinear phase shift over bulk. In one dimension, these structures are similar to interference bandpass filters and can be fabricated using multiple thin film layers. We have performed extensive numerical simulation which shows that nonlinear enhancements by two orders of magnitude should be possible. Initial experimental results using z-scan measurements on a multi-layer structure consisting of silicon dioxide and silicon nitride support these conclusions.

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