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Accession number:20122915253135
Title:Localized modes in a defectless photonic crystal waveguide at terahertz frequencies
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Source title:Optics Letters
Abbreviated source title:Opt. Lett.
Volume:37
Issue:13
Issue date:July 1, 2012
Publication year:2012
Pages:2727-2729
Language:English
ISSN:01469592
E-ISSN:15394794
CODEN:OPLEDP
Document type:Journal article (JA)
Publisher:Optical Society of America, 2010 Massachusetts Avenue NW, Washington, DC 20036-1023, United States
Abstract:We propose an idea to excite localized modes in a photonic crystal (PC) waveguide without ruining the discrete translational symmetry of the lattice. This can be done by arranging dispersive elements having negative permittivity over a desired frequency range into a periodic structure. We demonstrate numerically the realization of a cavity mode inside the air region of a geometrical defectless two-dimensional square-lattice PC consisting of polaritonic cylinders placed in air matrix. The corresponding waveguide structure in the form of a PC fiber supports the cavity mode as a guided mode to propagate along the guiding direction at very small propagation constant with near zero group velocity. These localized modes can be recognized as localized defectless modes inside the structure with four-fold symmetry. © 2012 Optical Society of America.
Number of references:13
Main heading:Photonic crystals
Controlled terms:Waveguides
Uncontrolled terms:Air matrix - Cavity mode - Dispersive elements - Fiber support - Four-fold symmetry - Frequency ranges - Guided modes - Localized modes - Negative permittivity - Photonic crystal waveguide - Propagation constant - Square-lattice - Terahertz frequencies - Translational symmetry - Waveguide structure - Zero-group velocity
Classification code:714.3 Waveguides - 933.1 Crystalline Solids
DOI:10.1364/OL.37.002727
Database:Compendex