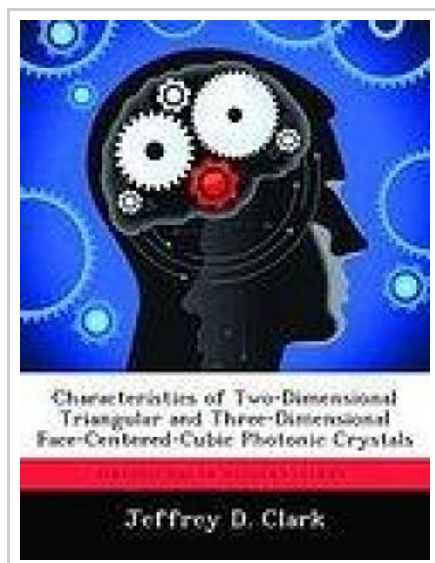




Characteristics of Two-Dimensional Triangular and Three-Dimensional Face-Centered-Cubic Photonic Crystals

By Jeffrey D. Clark

Biblioscholar Nov 2012, 2012. Taschenbuch. Book Condition: Neu. 246x189x11 mm. This item is printed on demand - Print on Demand Neuware - Photonic crystals (PhC's) are periodic structures of differing dielectrics that create a photonic band gap (PBG). A PBG, in turn, inhibits the propagation of electromagnetic waves of a specific frequency range. This thesis focuses on the fabrication and characterization of triangular-structured, two-dimensional PhC's with a PBG designed for visible wavelengths and with applications in visible integrated photonics systems. A three-dimensional PhC with a PBG in the infrared is also studied for its characteristics in regard to its PBG. The two-dimensional fabrication processes pursued were: focused ion beam, electron beam lithography and holographic photo-polymerization/lithography. The fabrication techniques and materials used to create the PhC in part determined the characterization technique required to investigate the PBG. Characterization techniques include: the coupling of a beam by means of a prism into a wave-guiding medium in which the PhC has been fabricated, Fourier transform infrared spectrometer, spectrophotometer, and edge ring techniques. Analysis of the transmission and reflectance properties of a PhC for various incident angles (within the two-dimensional plane of the PhC) confirms the presence of a PBG. The design of the PhC was based on a program created...

Reviews

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