



Band Structure in Photonic Crystals

By Pietro Contu

Edizioni Accademiche Italiane Dez 2013, 2013. Taschenbuch.
Book Condition: Neu. 220x150x10 mm. This item is printed on demand - Print on Demand Neuware - The main aspect of a photonic crystal is the periodic variation of its refractive index. This periodicity affects the motion of photons in a similar way as a periodic potential affects the motion of electrons in a semiconductor crystal. As a result, photonic crystals exhibit frequency intervals where incident light can propagate (bands) and frequency intervals in which incident light cannot propagate (band gaps). The union of bands and band gaps is called band spectrum. In this work the mathematical properties of photonic crystals have been studied with the purpose of finding satisfactory analytical and numerical methods to identify their band spectra. The problem studied in this research is of great mathematical and industrial interest. Its mathematical interest regards several direct and inverse scattering problems related to the propagation of electromagnetic waves in periodic media. Its importance to industry is related to the development of photonic devices which overcome various problems typical of electronic devices, such as overheating, excessive size and elevated cost of production. 172 pp. English.



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