

A numerical method for finding dispersion curves and guided waves of optical waveguides

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Abstract

The original problem in an unbounded domain is reduced to a linear parametric eigenvalue problem in a circle, which is convenient for numerical solution. The examination of the solvability of this problem is based on the spectral theory of compact self-adjoint operators. The existence of guided waves is proved, and properties of the dispersion curves are investigated. An algorithm for the numerical solution of the problem based on the discretization of the equations using the finite element method is proposed. Numerical results are discussed. Copyright © 2005 by AMIK "Nauka/Interperiodica".

Keywords

Dispersion curves, Eigenfunctions, Finite element method, Waveguide