Abstracts

Vectorial Wave Analysis of Inhomogeneous Optical Fibers Using Finite Element Method

A vectorial wave analysis of the propagation characteristics of radially inhomogeneous optical fibers is presented. The vectorial wave equation is first translated into a variational problem, and then it is solved by using the finite element method. The results are compared with those of the scalar wave analysis. The error caused by the scalar wave approximation is discussed for wide variety of refractive index profiles. It is shown that the error caused by the scalar wave approximation is about 0.1 percent for eigenvalues and 1 percent for delay time, when the relative index difference between core and cladding is 1 percent.

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