Abstracts

Scattering and Mode Conversion of Guided Modes by a Spherical Object in an Optical Fiber

N. Morita and N. Kumagai. "Scattering and Mode Conversion of Guided Modes by a Spherical Object in an Optical Fiber." 1980 Transactions on Microwave Theory and Techniques 28.2 (Feb. 1980 [T-MTT]): 137-141.

The scattering and the mode conversion of the guided modes due to a spherical object in a step-index optical fiber is analyzed theoretically. The incident fiber mode is expanded in terms of the spherical vector wave functions, and the scattered fields are obtained by applying the boundary conditions on the surface of the object with the aid of these expansions. The expression for the total scattered power and the mode conversion coefficients are given. As an example, the scattering and mode conversion caused by a spherical air bubble are evaluated numerically.

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