Abstracts

Analysis of Wave Propagation in Optical Fibers Having Core with alpha-Power Refractive-Index Distribution and Uniform Cladding

K. Okamoto and T. Okoshi. "Analysis of Wave Propagation in Optical Fibers Having Core with alpha-Power Refractive-Index Distribution and Uniform Cladding." 1976 Transactions on Microwave Theory and Techniques 24.7 (Jul. 1976 [T-MTT]): 416-421.

This paper describes first that a simple closed-form characteristic equation can be derived from the variational formulation of the wave propagation in an optical fiber, provided that 1) the permittivity in the core is proportional to r/sup alpha/, where r is the radial coordinate and 1 < alpha < /spl infin/, and 2) the cladding is uniform. The obtained equation is then solved for various permittivity (or refractive-index) profiles. The results obtained are useful both for the understanding of the dispersion characteristics and for the design of inhomogeneous optical fibers. The optimum profile for a multimode fiber is derived and discussed.

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