Abstracts

The Relations Between Scalar Modes in a Lenslike Medium and Vector Modes in a Self-Focusing Optical Fiber (Short Papers)

G.L. Yip and S. Nemoto. "The Relations Between Scalar Modes in a Lenslike Medium and Vector Modes in a Self-Focusing Optical Fiber (Short Papers)." 1975 Transactions on Microwave Theory and Techniques 23.2 (Feb. 1975 [T-MTT]): 260-263.

The relations are established between the scalar modes in an infinite lenslike medium and the vector modes in a self-focusing optical fiber with a finite homogeneous cladding. It is shown that both the transverse fields and the longitudinal fields of the vector modes can be expressed in terms of the scalar modes, provided the fiber is operated in the core mode region. Otherwise, significant discrepancies could arise. The scalar modes, however, cannot describe the cladding modes which are caused by the index discontintuity at the outer surface of the cladding.

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