Abstracts

High-Accuracy WKB Analyses of alpha-Power Graded-Core Fibers

K. Oyamada and T. Okoshi. "High-Accuracy WKB Analyses of alpha-Power Graded-Core Fibers." 1980 Transactions on Microwave Theory and Techniques 28.8 (Aug. 1980 [T-MTT]): 839-845.

The WKB method is an effective approach to the analyses of propagation characteristics of optical fibers. However, conventional WKB analyses can not be applied to close-to-cutoff modes because the effect of core-cladding boundary is not considered exactly. This paper proposes two improved WKB analyses which consider the above effect more exactly. Both of these methods are applicable to the close-to-cutoff modes. The first one is superior in accuracy (for example, relative error in cutoff frequencies <=10/sup -5/), but applicable only to quadratic profiles. The second one is applicable to general alpha -power profiles; the accuracy is poorer but tolerable for most practical purposes.

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