

A Method Extending the Boundary Condition for Analyzing Guided Modes of Dielectric Waveguides of Arbitrary Cross-Sectional Shape

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A method based on the extended boundary condition method is presented for analyzing guided modes of dielectric waveguides of arbitrary cross-sectional shape. Numerical integration needed in this method is only over the boundary periphery line of the waveguide. Nevertheless, it is applicable to the waveguides with any refractive index difference between core and cladding ranging from negligibly small to considerably large difference, as well as to certain types of waveguide with inhomogeneous core. Approximate formulas for the case of weakly guiding are also derivable from the general basic set of equations presented. Numerical examples are given to verify the usefulness and accuracy of this method.

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