# Abstracts

## Asymptotic Expressions for Eigenfunctions and Eigenvalues of a Dielectric or Optical Waveguide

*A.W. Snyder. "Asymptotic Expressions for Eigenfunctions and Eigenvalues of a Dielectric or Optical Waveguide." 1969 Transactions on Microwave Theory and Techniques 17.12 (Dec. 1969 [T-MTT]): 1130-1138.*

An asymptotic technique is presented, resulting in an analytically simple self-consistent description of the modes of a circular dielectric structure. When the dielectric difference between the rod and surrounding medium is small, the asymptotic expressions are valid for all frequencies. Even when the inside dielectric constant is twice the outside, less than a 10 percent error is usually involved. A simple functional expression for the eigenvalues of both the circular rod and the dielectric slab results from the analysis, thus eliminating the need for numerical or graphical methods.

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