Abstracts

A Simple Approach to Mode Analysis for Parabolic Waveguides

C.S. Kenney and P.L. Overfelt. "A Simple Approach to Mode Analysis for Parabolic Waveguides." 1991 Transactions on Microwave Theory and Techniques 39.3 (Mar. 1991 [T-MTT]): 405-412.

Difficulty in obtaining accurate values for parabolic cylinder functions has been an impediment to mode analysis for parabolic waveguides. A simple method, based on one-dimensional analytic continuation, is presented which gives essentially exact values for these functions; i.e., the relative error in the computed result is on the order of the machine round-off. When supplemented with a Newton-Poisson shooting method and simple homotopy techniques, this continuation method can be used to find the TE and TM mode eigenvalues, and associated separation constants, for arbitrary parabolic domains. These methods are then used to compute a power handling efficiency factor for a range of parabolic regions.

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