Abstracts

Propagation in Rectangular Waveguide Filled with Skew Uniaxial Dielectric

J.B. Davies. "Propagation in Rectangular Waveguide Filled with Skew Uniaxial Dielectric." 1967 Transactions on Microwave Theory and Techniques 15.6 (Jun. 1967 [T-MTT]): 372-376.

A solution is given for propagation in rectangular waveguide fully loaded with a uniaxial dielectric, with the C-axis lying anywhere in the transverse plane. This problem arises in the design of particular traveling-wave masers. By application of the Rayleigh-Ritz method to Berk's variational expression, the problem is reduced to a matrix eigenvalue problem, and in a form suitable for direct evaluation on a digital computer. An explicit approximate solution is, however, shown to give accurate results. The analysis can be interpreted directly in terms of mode coupling of the usual rectangular waveguide modes, and the possible extension is indicated to general tensor media and to circular or elliptical waveguide.

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