Abstracts

Modal Analysis of the "Gap Effect" in Waveguide Dielectric Measurements (Short Papers)

S.B. Wilson. "Modal Analysis of the "Gap Effect" in Waveguide Dielectric Measurements (Short Papers)." 1988 Transactions on Microwave Theory and Techniques 36.4 (Apr. 1988 [T-MTT]): 752-756.

In waveguide measurements on dielectric slabs, small air gaps between the guide walls and the dielectric sample are found to be capable of radically altering the complex reflection and transmission coefficients of the excitation mode. The modal-analysis representation is used to compute these coefficients for low- and high-loss samples with air gaps. The "gap effect" is explained qualitatively by considering the influence of the dominant "slab mode," which focuses its energy into the dielectric slab, and the dominant "gap mode," which focuses its energy into the air gap. An experimental approach, which consists of filling the air gap with conducting paste, is shown to essentially correct the problem altogether.

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