Abstracts

Analysis of Single and Coupled Microstrip Lines on Anisotropic Substrates Using Differential Matrix Operators and the Spectral-Domain Method

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In this paper, a differential matrix operator technique is presented to simplify the formulation of boundary-value problems for open millimeter-wave integrated circuits (MIC's) which use anisotropic substrates. The spectral-domain method is applied to analyze the propagation characteristics of single and coupled microstrip lines printed on anisotropic substrates whose properties are described by both [epsilon] and [μ] tensors. In addition to considering the permittivity and permeability as a uniaxial or biaxial tensor, the effects of coordinate misalignment between the principal axes of [epsilon] and those of the structure in the transverse plane are also included. It is shown that the misalignment in [epsilon] and the presence of the [μ] tensor has a significant effect on the dispersive properties of these two structures.

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