Abstracts

The Method of Lines Applied to a Finline/Strip Configuration on an Anisotropic Substrate

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The method of lines (MOL), a numerical scheme for the solution of partial differential equations that recently has been adapted to the full-wave dispersive characterization of planar waveguide structures, is modified to treat cases having uniaxially anisotropic dielectric regions. Anisotropy is present in commonly used substrate materials and typically leads to significant modeling error if neglected. The modus operandi of the method of lines is the discretization of spatial variables into a set of lines. Consequently, partial differential equations are reduced to ordinary kinds possessing simple, closed-form solutions. Being simple from the onset, the analysis effects an easily implemented method of good and controllable accuracy. The paper's formulation is exercised upon an interesting form of finline, one with both a fin and an isolated strip opposite one another on a uniaxial substrate. Computations providing dispersive effective permittivities and impedances highlight the errors incurred in neglecting anisotropy.

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