Abstracts

Modeling Lossy Anisotropic Dielectric Waveguides with the Method of Lines

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This paper presents a new formulation useful for modeling waveguides constructed from lossy inhomogeneous anisotropic media. Our approach is based on a pair of Sturm-Liouville type wave equations that have been derived to handle inhomogeneous, diagonalized complex permittivity and permeability tensors. The method of lines is then applied to these wave equations, and related field equations, creating an indirect eigenvalue problem that correctly models this class of structure. Some refinements to the method of lines are also proposed, particularly, regarding the construction of the modal matrices found in the eigenvalue problem. Using our approach, modal dispersion curves have been computed for millimeter-wave and optical structures. Comparisons made with results available from the literature validate our approach.

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