Abstracts

Modeling and Analysis of Guided-Wave Structures Involving Both Bi-Isotropic and Bi-Anisotropic Media

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A new strategy of modeling and analysis with transmission line matrix (TLM) algorithm is developed to account for dynamic effects of both bi-isotropic and bi-anisotropic media on propagation and scattering characteristics. First, the symmetrical condensed node in the frequency-domain is generalized to involving bi-anisotropic media. The nodal scattering matrix is derived directly from Maxwell's equations using the centered finite difference and the transformation of variable. With the proposed node, a frequency-domain TLM algorithm is then established for analysis of propagation and scattering of arbitrary waveguiding structures including discontinuities such as chiral-filled rectangular waveguide, microstrip on a bi-isotropic non-reciprocal or chiral substrate. It is shown that the proposed TLM modeling provides a powerful tool for theoretical study of a new class of complex materials.

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