Abstracts

Finite-Element Method with Edge Elements for Waveguides Loaded with Ferrite Magnetized in Arbitrary Direction

L. Zhou and L.E. Davis. "Finite-Element Method with Edge Elements for Waveguides Loaded with Ferrite Magnetized in Arbitrary Direction." 1996 Transactions on Microwave Theory and Techniques 44.6 (Jun. 1996 [T-MTT]): 809-815.

In this paper, finite-element method (FEM) formulations with edge elements for directly calculating the phase constants of ferrite-loaded waveguides with arbitrarily magnetized directions are presented. Dispersion characteristics are calculated for the partially-filled ferrite rectangular waveguide structure, where the dc field is in any arbitrary direction including parallel to any of the three axes. The variation of phase constants with the direction of dc magnetic field is illustrated. In order to solve the quadratic eigenvalue equation, which appears in the case where the magnetized direction is not parallel to the propagation, a simple and effective approach is proposed with no increase in the size of the matrices.

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