Abstracts

Applied Field/Frequency Dependency of Propagation in Axially Magnetized Ferrite Waveguides

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Vector finite element solvers are used to calculate phase constants and cutoff wave numbers in waveguides containing axially magnetized ferrite media. For phase constant calculations, ferrite characteristics are specified in terms of the applied field, frequency, and material characteristics including saturation magnetization and data from the hysteresis curve. Periodic boundary conditions are used with both finite element formulations to improve efficiency by reducing the size of the meshed region. Cutoff planes and phase shifts have been calculated for two examples, a Reggia-Spencer phase shifter and a ridged Faraday rotation section. In each case comparisons are made with measured data in the literature. The ridged Faraday section was found to be multimode over the design bandwidth. For completeness, the geometrical dependency of the cutoff plane in circular quadruply ridged waveguides is enunciated and compared with available experimental results.

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