Abstracts

Dispersion analysis of multilayer cylindrical transmission lines containing magnetized ferrite substrates

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Recently, there has been a growing interest in using cylindrical transmission lines that contain magnetized ferrite material in a variety of applications. In this paper, the finite-difference time-domain (FDTD) method (in cylindrical coordinates) and the spectral-domain analysis (SDA) are used to calculate the propagation characteristics of cylindrical transmission lines that contain magnetized ferrite material. The magnetization can be either in the longitudinal or azimuthal directions. Specifically, the cylindrical microstrip line, and the cylindrical coplanar waveguide printed on magnetized ferrite substrate are analyzed. Both the FDTD and SDA results are in very good agreement. In addition, the results are compared to those of planar structures by taking the radius of the substrate to be large enough such that the curvature effect is negligible.

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