Abstracts

Application of the Eigenmode Transformation Technique for the Analysis of Planar Transmission Lines (Dec. 1996, Part II [T-MTT])

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The eigenmode transformation technique is formulated for the analysis of inhomogeneously filled shielded waveguides containing metal inserts. The permittivity of the filling medium may be an arbitrary function of the transverse coordinates. The method is based on expanding the electromagnetic field in terms of the eigemnodes of the corresponding empty shielding waveguide. The metal inserts have first the effect of linearly transforming the eigenmodes of the empty guide into those of the shielded waveguide containing the metal inserts (including the TEM-modes). Next the inhomogeneity of the filling medium is taken into account which leads to a proper matrix eigenvalue problem. In addition an alternative formulation is derived from a variational approach. Results of both formulations are compared for a shielded circular dielectric waveguide. The eigenmode transformation technique is applied to various types of planar transmission lines, i.e., coupled microstrip lines, finlines, and coplanar lines. The results are compared with those of other methods.

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