Abstracts

Coupled-Mode Formulation of Multilayered and Multiconductor Transmission Lines

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A novel coupled-mode formulation for multilayered and multiconductor transmission lines is developed. In this formulation, the solutions to the original multiconductor system are approximated by a linear combination of eigenmode solutions associated with the isolated single conductor line located in an appropriate reference dielectric medium, and the reciprocity theorem is used to derive the coupled-mode equations. The coupling coefficients are expressed in terms of the simple overlap integrals between the eigenmode fields and currents of the individual conductor lines. As a basic application, the dispersion characteristics of two identical coupled-microstrip lines are analyzed using the proposed coupled-mode theory. It is shown that the results are in very close agreement with those obtained by the direct Galerkin's moment method over a broad range of weak to strong coupling.

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