Abstracts

Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines

Y. Yuan and D.P. Nyquist. "Full-Wave Perturbation Theory Based Upon Electric Field Integral Equations for Coupled Microstrip Transmission Lines." 1990 Transactions on Microwave Theory and Techniques 38.11 (Nov. 1990 [T-MTT]): 1576-1584.

A full-wave perturbation theory for the system of N coupled microstrip transmission lines is developed based on an integral equation description of the microstrip circuit structure. The perturbation theory is suitable for application to nearly degenerate multistrip coupling. The physical justification of the perturbation approximation is based upon the current distributions on the strips. The associated computational procedure is relatively simple. For the case of two coupled lines, it is found that the propagation eigenvalues split and shift symmetrically away from the average of their isolated limits as the microstrips become closely spaced. Numerical results obtained by the perturbation theory are compared with those obtained by a more accurate method of moments solution of coupled electric field integral equations. An experimental PC-board implementation is set up, electric field distributions are measured, and the results are found to be in good agreement with the theoretical prediction.

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