Abstracts

Capacitance of Microstrip Lines with Inhomogeneous Substrate

A mode-matching approach combined with Galerkin's method is proposed in this paper to calculate the capacitance matrix of microstrip lines embedded in an inhomogeneous stratified medium. Eigenmodes in each layer is first solved numerically, and the potential in each layer can be expressed in terms of these eigenmodes. Coupling between two sets of eigenmodes in contiguous layers are described by defining reflection matrices. A Green's function is thus obtained in terms of these eigenmode sets to relate the potential to a line charge. Integral equation is then constructed relating the charge distribution and the imposed voltage on the microstrip surface. Galerkin's method is next applied to solve the charge distribution and hence the capacitance matrix. Several inhomogeneous profiles are studied to understand the effects of inhomogeneities on the capacitance and relevant parameters.

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