Abstracts

Analysis of unbounded and bounded circuits and antennas considering finite extent and inhomogeneous dielectric

Xiaohong Jiang and K. Wu. "Analysis of unbounded and bounded circuits and antennas considering finite extent and inhomogeneous dielectric." 1997 MTT-S International Microwave Symposium Digest 2. (1997 Vol. II [MWSYM]): 617-620.

A field-theoretical algorithm is presented for characterizing unbounded and bounded circuits and antennas. Finite extent and inhomogeneous dielectric layer are rigorously considered in this method of lines-based model. The unbounded effects are determined with an improved lossy absorbing boundary condition (LABC) which can handle both propagating and evanescent waves. This analysis accounts for all the physical effects including electromagnetic coupling, evanescent higher-order modes, space-wave radiation and surface-wave leakage losses. Examples are given for unbounded loss effects including microstrip open-end deposited on a finite dielectric substrate and gap discontinuities on an inhomogeneous layer. Results indicate that the unbounded loss may be controlled by certain finite extent of the dielectric layer.

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