Abstracts

Flexibility in the Choice of Green's Function for the Boundary Element Method (Oct. 1994 [T-MTT])

T.-N. Chang and Y.C. Sze. "Flexibility in the Choice of Green's Function for the Boundary Element Method (Oct. 1994 [T-MTT])." 1994 Transactions on Microwave Theory and Techniques 42.10 (Oct. 1994 [T-MTT]): 1973-1977.

Several useful Green's functions are derived for the quasi-static analysis of shielded planar transmission lines by the boundary element method. These newly employed Green's functions satisfy forced boundary conditions in a rectangular region. The integral equation does not have a singular point and the integrand contains only the normal derivative of the electric potential. The present method is proposed to characterize multilayered and multi-conductor structures. Numerical results are presented for a microstrip, a suspended line, and a coplanar waveguide. For the coplanar waveguide, a combined Green's function is also studied. This combined Green's function further reduces the memory size in computation. All of these Green's functions are represented in infinite series. The resulting matrix equation has slowly convergent matrix elements. To reduce the computation time of matrix elements, we split the original series in two parts. The geometric series method is employed to convert one part into a fast convergent form (4 terms). For the other part, only a few terms (less than 20) require computation.

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