Abstracts

Efficient method-of-moments formulation for the modeling of planar conductive layers in a shielded guided-wave structure

A.I. Khalil, A.B. Yakovlev and M.B. Steer. "Efficient method-of-moments formulation for the modeling of planar conductive layers in a shielded guided-wave structure." 1999 Transactions on Microwave Theory and Techniques 47.9 (Sep. 1999, Part I [T-MTT]): 1730-1736.

An electric-field integral-equation formulation discretized via the method of moments (MoM) is proposed for the analysis of arbitrarily shaped planar conductive layers in a shielded guided-wave structure. The method results in a generalized scattering matrix (GSM) for the planar structure and can be used with other GSM's, derived using this or other techniques, to model cascaded structures in waveguide. The Kummer transformation is applied to accelerate slowly converging double series expansions of impedance matrix elements obtained in the MoM solution. In this transformation, the quasi-static part associated with a singularity of the electric-type Green's function in the region of a conductive layer is extracted and evaluated in terms of modified Bessel functions, resulting in a dramatic reduction of terms in a double series summation. The proposed technique permits the modeling of a variety of conductive frequency-selective surfaces, including quasi-optical grids and patch arrays for application to spatial power combining.

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