Abstracts

Design of planar circuit structures with an efficient magnetostatic-field solver

S. Lindenmeier and P. Russer. "Design of planar circuit structures with an efficient magnetostatic-field solver." 1997 Transactions on Microwave Theory and Techniques 45.12 (Dec. 1997, Part II [T-MTT] (1997 Symposium Issue)): 2468-2473.

We introduce a highly efficient field solver for the calculation of the quasi-static magnetic field in order to design lossless planar circuit elements with nearly arbitrary shape. The field solver is based on a finite-difference (FD) formulation of a scalar magnetic potential, using potential partitioning surfaces (PPS's). The modeling of the quasi-static fields in distributed circuit elements leads to the development of lumped element equivalent circuits in a very fast and efficient way. For structures with sizes far below the wavelength, the equivalent circuits can be derived in a direct way. For the field modeling of larger structures, the quasi-static field solver can be used in a hybrid full-wave analysis as well. Numerical examples are presented for different planar-circuit elements.

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