Abstracts

Electromagnetic optimization of 3-D structures

J.W. Bandler, R.M. Biernacki, Shao Hua Chen, L.W. Hendrick and D. Omeragic. "Electromagnetic optimization of 3-D structures." 1997 Transactions on Microwave Theory and Techniques 45.5 (May 1997, Part II [T-MTT]): 770-779.

This paper discusses novel techniques and methodologies suitable for automated electromagnetic (EM) design of arbitrary three-dimensional (3-D) structures. In the context of parameterization of arbitrary 3-D structures, the authors outline the concept of the geometry capture technique. The authors present efficient response interpolation with respect to optimizable parameters-the key to effective automation. The authors' formulation is based on the maximally flat quadratic interpolation (MFQI) technique and provides gradient estimation essential to efficient optimization. The authors address the issue of storing the results of expensive EM simulations in a dynamically updated database, integrated with the interpolation technique. The automated EM optimization process is illustrated by the design of waveguide mitered bends. The authors also apply the aggressive space mapping (SM) technique to the optimization of multistep waveguide transformers.

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