Abstracts

A hybrid aggressive space-mapping algorithm for EM optimization

M.H. Bakr, J.W. Bandler, N. Georgieva and K. Madsen. "A hybrid aggressive space-mapping algorithm for EM optimization." 1999 Transactions on Microwave Theory and Techniques 47.12 (Dec. 1999 [T-MTT] (Special Issue on 1999 International Microwave Symposium)): 2440-2449.

We propose a novel hybrid aggressive space-mapping (HASM) optimization algorithm. HASM exploits both the trust-region aggressive space-mapping (TRASM) strategy and direct optimization. Severe differences between the coarse and fine models and nonuniqueness of the parameter extraction procedure may cause the TRASM algorithm to be trapped in local minima. The HASM algorithm is based on a novel lemma that enables smooth switching from the TRASM optimization to direct optimization if the TRASM algorithm is not converging. It also enables switching back from direct optimization to the TRASM algorithm in a smooth way. The uniqueness of the extraction step is improved by utilizing a good starting point. The algorithm does not assume that the final space-mapped design is the true optimal design and is robust against severe misalignment between the coarse and fine models. The examples include a seven-section waveguide transformer, the design of a H-plane waveguide filter, and a double-folded stub filter.

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