Abstracts

Space-mapping optimization of microwave circuits exploiting surrogate models

M.H. Bakr, J.W. Bandler, K. Madsen, J.E. Rayas-Sanchez and J. Sondergaard. "Space-mapping optimization of microwave circuits exploiting surrogate models." 2000 Transactions on Microwave Theory and Techniques 48.12 (Dec. 2000 [T-MTT] (Special Issue on 2000 International Microwave Symposium)): 2297-2306.

A powerful new space-mapping (SM) optimization algorithm is presented in this paper. It draws upon recent developments in both surrogate model-based optimization and modeling of microwave devices, SM optimization is formulated as a general optimization problem of a surrogate model. This model is a convex combination of a mapped coarse model and a linearized fine model. It exploits, in a novel way, a linear frequency-sensitive mapping. During the optimization iterates, the coarse and fine models are simulated at different sets of frequencies. This approach is shown to be especially powerful if a significant response shift exists. The algorithm is illustrated through the design of a capacitively loaded 10:1 impedance transformer and a double-folded stub filter. A high-temperature superconducting filter is also designed using decoupled frequency and SMs.

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