Abstracts

EM-based optimization exploiting partial space mapping and exact sensitivities (Dec. 2002 [T-MTT])

J.W. Bandler, A.S. Mohamed, M.H. Bakr, K. Madsen and J. Sondergaard. "EM-based optimization exploiting partial space mapping and exact sensitivities (Dec. 2002 [T-MTT])." 2002 Transactions on Microwave Theory and Techniques 50.12 (Dec. 2002 [T-MTT] (Special Issue on 2002 International Microwave Symposium)): 2741-2750.

We present a family of robust techniques for exploiting sensitivities in electromagnetic (EM)-based circuit optimization through space mapping (SM) technology. We utilize derivative information for parameter extractions and mapping updates. We exploit a partial SM (PSM) concept, where a reduced set of parameters is sufficient for parameter extraction optimization. It reflects the idea of tuning and execution time is reduced. Upfront gradients of both EM (fine) model and coarse surrogates can initialize possible mapping approximations. We introduce several effective approaches for updating the mapping during the optimization iterations. Examples include the classical Rosenbrock function, modified to illustrate the approach, a two-section transmission-line 10:1 impedance transformer and a microstrip bandstop filter with open stubs.

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