Abstracts

Space Mapping Technique for Electromagnetic Optimization

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We offer space mapping (SM), a fundamental uew theory to circuit optimization utilizing a parameter space transformation. This technique is demonstrated by the optimization of a microstrip structure for which a convenient analytical/empirical model is assumed to be unavailable. For illustration, we focus upon a three-section microstrip impedance transformer and a double folded stub microstrip filter and explore various design characteristics utilizing an electromagnetic (EM) field simulator. We propose two distinct EM models: coarse for fast computations, and the corresponding fine for a few more accurate and well-targeted simulations. The coarse model, useful when circuit-theoretic models are not readily available, permits rapid exploration of different starting points, solution robustness, local minima, parameter sensitivities, yield-driven design and other design characteristics within a practical time frame. The computationally intensive fine model is used to verify the space-mapped designs obtained exploiting the coarse model, as well as in the SM process itself.

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