# Abstracts

## Automated filter tuning using generalized low-pass prototype networks and gradient-based parameter extraction

*P. Harscher, R. Vahldieck and S. Amari. "Automated filter tuning using generalized low-pass prototype networks and gradient-based parameter extraction." 2001 Transactions on Microwave Theory and Techniques 49.12 (Dec. 2001 [T-MTT] (Special Issue on 2001 International Microwave Symposium)): 2532-2538.*

A novel technique for automated filter tuning is introduced. The filter to be tuned is represented by a generalized filter low-pass prototype model rather than a specialized equivalent network. The prototype model is based on the minimum number of characteristic filter parameters to represent the filter transfer function correctly. The parameter values are found from a gradient-based parameter-extraction process using measured S-parameters. Automated filter tuning is performed as a two-step procedure. First, the parameter sensitivities with respect to the tuning elements are determined by a series of S-parameter measurements. Second, the parameter values of the filter are compared to the values of the ideal filter prototype found from a filter synthesis, thus yielding the optimal screw positions. This novel tuning technique has been tested successfully with direct coupled three-resonator and cross-coupled four- and six-resonator filters.

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