# Abstracts

## Adaptive synthesis and design of resonator filters with source/load-multiresonator coupling

*S. Amari, U. Rosenberg and J. Bornemann. "Adaptive synthesis and design of resonator filters with source/load-multiresonator coupling." 2002 Transactions on Microwave Theory and Techniques 50.8 (Aug. 2002 [T-MTT]): 1969-1978.*

The paper presents a universal and comprehensive synthesis technique of coupled resonator filters with source/load-multiresonator coupling. The approach is based on repeated analyses of a circuit with the desired topology; no similarity transformation is needed. Restrictions imposed by the implementation on the coupling coefficients such as signs and orders of magnitudes are straightforwardly handled within this technique. The technique is then used to synthesize and design filters with full or almost full coupling matrices by selecting, among the infinite number of solutions, the matrix that corresponds to the actual implementation. In such cases, analytical techniques and those based on similarity transformations cannot be used since they provide no mechanism to constrain individual coupling coefficients in order to discriminate between two full coupling matrices, which are both solutions to the synthesis problem. Using the technique described in this paper, a filter designer can extract the coupling matrix of a filter of arbitrary order and topology while enforcing relevant constraints. There is no need to master all the different existing similarity-transformation-based techniques and the topologies to which they are applicable. For the first time, detailed investigations of parasitic coupling effects, for either compensation or utilization, are made possible. The method is applied to the synthesis of a variety of filters, some of which are then designed and built and their response measured.

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