Abstracts

Wave Sensitivities of Networks

J.W. Bandler and R.E. Seviora. "Wave Sensitivities of Networks." 1972 Transactions on Microwave Theory and Techniques 20.2 (Feb. 1972 [T-MTT]): 138-147.

A theoretical foundation is presented for the efficient computation of first- and second-order sensitivities of networks with respect to network parameters in terms of wave variables. The concept of the adjoint network is used. First-order sensitivity formulas for a wide variety of elements are presented, including lumped and uniformly distributed elements, active and passive elements, and reciprocal and nonreciprocal elements. Parameters include electrical quantities, geometrical dimensions, and frequency. It is shown how gradients related to wave-based least pth and minimax objective functions can be computed. A comparison with a method which avoids the need for analysis of adjoint networks is made. Applications in the computer-aided design of networks using efficient gradient minimization methods are envisaged.

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