Abstracts

Efficient Computation of the Steady-State Response of Periodic Nonlinear Microwave Circuits Using a Convolution-Based Sample-Balance Technique (Short Papers)

This paper describes an efficient and robust approach to the computation of the steady-state response of periodic nonlinear microwave circuits. The problem of solving a set of differential equations, in this case, is converted into that of solving a system of nonlinear algebraic equations using a technique which is termed convolution-based sample balance. Although exact in all cases for which harmonic-balance techniques are exact, this technique does not require the use of discrete Fourier transforms, and calculating the Jacobian is straightforward. For the solution of the resulting system of nonlinear equations, an efficient and yet very robust algorithm has been developed. In the examples given, savings in computational effort of over 85% are reported when this algorithm is compared with Newton's method.

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