# Abstracts

## General Noise Analysis of Nonlinear Microwave Circuits by the Piecewise Harmonic-Balance Technique

*V. Rizzoli, F. Mastri and D. Masotti. "General Noise Analysis of Nonlinear Microwave Circuits by the Piecewise Harmonic-Balance Technique." 1994 Transactions on Microwave Theory and Techniques 42.5 (May 1994 [T-MTT]): 807-819.*

This paper presents a self-consistent set of algorithms for the numerical computation of noise effects in forced and autonomous nonlinear microwave circuits. The analysis relies upon the piecewise harmonic-balance method, and thus retains all the peculiar advantages of this technique, including general-purposeness in the widest sense. The noise simulation capabilities include any kind of forced or autonomous nonlinear circuit operated in a time-periodic large-signal steady state, as well as microwave mixers of arbitrary topology. The limitations of the traditional frequency-conversion approach to noise analysis are overcome. The analysis takes into account the thermal noise generated in the passive subnetwork, the noise contributions of linear and nonlinear active devices, and the noise injected by sinusoidal driving sources of known statistical properties. The nonlinear noise models of two representative families of microwave devices (FET's/HEMT's and Schottky-barrier diodes) are discussed in detail, and several applications are illustrated.

❑ Return to main document.