Abstracts

A Nonlinear Integral Model of Electron Devices for HB Circuit Analysis

F. Filicori, G. Vannini and V.A. Monaco. "A Nonlinear Integral Model of Electron Devices for HB Circuit Analysis." 1992 Transactions on Microwave Theory and Techniques 40.7 (Jul. 1992 [T-MTT] (Special Issue on Process-Oriented Microwave CAD and Modeling)): 1456-1465.

A technology-independent large-signal model of electron devices, the Nonlinear Integral Model (NIM), is proposed. It is rigorously derived from the Volterra series under basic assumptions valid for most types of electron devices and is suitable for Harmonic-Balance circuit analysis. Unlike other Volterra-based approaches, the validity of the NIM is not limited to weakly nonlinear operation. In particular, the proposed model allows the large-signal dynamic response of an electron device to be directly computed on the basis of data obtained either by conventional measurements or by physics-based numerical simulations. In this perspective, it provides a valuable tool for linking accurate device simulations based on carrier transport physics and Harmonic-Balance circuit analysis algorithms. Simulations and experimental results, which confirm the validity of the Nonlinear Integral Model, are also presented.

❑ Return to main document.