Abstracts

Numerical Analysis of Nonlinear Solid-State Device Excitation in Microwave Circuits

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This paper presents an efficient technique for the numerical determination of voltage and current waveforms when a microwave circuit containing one or more nonlinear elements is excited by a single frequency source. The approach described here is readily applied to microwave networks represented by a large number of equivalent circuit elements, either lumped or distributed. A significant feature of this paper is the detailed investigation of the problem of convergence, using this new technique. The generality of the techniqne is illustrated through its application to studies of the excitation of varactor, Schottky-barrier, and IMPATT diodes in waveguide circuits. In addition, the relationship of this method to the multiple reflection approach is discussed and the convergence mechanism of this reflection technique is studied.

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