Abstracts

Efficient Solution Method for Unified Nonlinear Microwave Circuit and Numerical Solid-State Device Simulation

G.B. Tait. "Efficient Solution Method for Unified Nonlinear Microwave Circuit and Numerical Solid-State Device Simulation." 1994 Microwave and Guided Wave Letters 4.12 (Dec. 1994 [MGWL]): 420-422.

A simple and very efficient harmonic-balance technique is presented that is suitable for the steady-state analysis of nonlinear microwave and millimeter-wave circuits that require physics-based, fully numerical simulations of charge carrier transport in the solid-state device. The practical integration of a numerical device simulator with a nonlinear circuit simulator requires a robust and fast circuit solution algorithm. The new circuit solution algorithm was applied to a test simulation of a 100- to 300-GHz multiplier circuit, achieving a savings in computational effort of 98% and a reduction in execution time by a factor of 33 over contending harmonic-balance techniques.

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