Abstracts

The Exploitation of Sparse-Matrix Techniques in Conjunction with the Piecewise Harmonic-Balance Method for Nonlinear Microwave Circuit Analysis

V. Rizzoli, F. Mastri, F. Sgallari and V. Frontini. "The Exploitation of Sparse-Matrix Techniques in Conjunction with the Piecewise Harmonic-Balance Method for Nonlinear Microwave Circuit Analysis." 1990 MTT-S International Microwave Symposium Digest 90.3 (1990 Vol. III [MWSYM]): 1295-1298.

The paper describes a novel sparse-matrix approach to the simulation of nonlinear microwave circuits by the Newton-iteration-based piecewise harmonic-balance technique. Selected elements of the Jacobian matrix are set to zero according to some physical criterion, which leads to a sparse Jacobian with a preselected the pattern of nonzeros. This allows the use of specialized sparse-matrix solvers, with an effective optimization of both memory storage and CPU time. The code has been developed in both a scalar and a vectorized version optimized for the Cray Y-MP supercomputer.

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