Abstracts

Analysis of signal integrity in high-speed digital ICs, by combining MOSFET modeling and the LE-FDTD method

For the reliable design of high-speed digital integrated circuits, signal integrity analysis of the critical interconnection lines needs to be performed. Such an analysis should account for electromagnetic effects (propagation, impedance mismatch, cross-talk and substrate losses) as well as for the nonlinear behavior of the active circuitry. This work proposes a comprehensive approach to carry-out the above analysis. In particular, an accurate MOSFET analytical model, suitable for advanced submicrometric microelectronic technologies, has been incorporated in a full-wave simulator based on the Lumped Element Finite Difference Time Domain (LE-FDTD) method. In this abstract, discretization and implementation procedures are discussed, and some preliminary simulations, aimed at validating the approach, are presented.

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