Abstracts

Electromagnetic modeling of interconnects for mixed-signal integrated circuits from DC to multi-GHz frequencies

A. Rong and A.C. Cangellaris. "Electromagnetic modeling of interconnects for mixed-signal integrated circuits from DC to multi-GHz frequencies." 2002 MTT-S International Microwave Symposium Digest 02.3 (2002 Vol. III [MWSYM]): 1893-1896 vol.3.

This paper presents a numerically stable methodology for the electromagnetic analysis of three-dimensional interconnect structures from very low (almost dc) to multi-GHz frequencies. The proposed methodology is based on a generalized version of the partial element equivalent circuit interpretation of the electric field integral equation that utilizes triangular cells for the discretization of conductor surfaces and thus is capable of handling structures of arbitrary shapes. The numerical stability of the approximate problem at very low frequencies is achieved through capturing an appropriate tree of the network graph, yielding an enhanced circuit mesh analysis. Numerical experiments are used to demonstrate the numerical stability of the numerical methodology even for frequencies at which the structure under study is a minute fraction of the wavelength.

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