Abstracts

Efficient large-domain MoM solutions to electrically large practical EM problems

B.M. Notaros, B.D. Popovic, J.P. Weem, R.A. Brown and Z. Popovic. "Efficient large-domain MoM solutions to electrically large practical EM problems." 2001 Transactions on Microwave Theory and Techniques 49.1 (Jan. 2001 [T-MTT] (Mini-Special Issue on 2000 Radio-Frequency Integrated Circuits (RFIC) Conference and Automatic Radio Frequency Techniques Group (ARFTG) Meeting)): 151-159.

A numerical method is presented for the analysis and design of a wide variety of electromagnetic (EM) structures consisting of dielectric and conducting parts of arbitrary shapes. The method is based on the integral-equation formulation in frequency domain, and represents a large domain (high-order expansion) Galerkin-type version of the method of moments (MoM). The method is formulated in two versions concerning the type of the equivalence (volume and surface) utilized in the treatment of the dielectric parts of the structure. The generality, versatility, accuracy, and practicality of the method and code are demonstrated on four very diverse, electrically large, and complex EM problems. The examples are: an X-band reflector antenna modeled after a bat's ear, which is about 11/spl lambda//sup 3/ large at X-band; a broad-band (0.5-4.5 GHz) nested array of crossed loaded dipoles; an EM system consisting of a dipole antenna and a human body, and a broad-band (1-5 GHz) microstrip-fed Vivaldi antenna with a high-permittivity dielectric substrate. The central processing unit times with a modest personal computer are on the order of several minutes for a single-frequency application.

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