

PEEC Solution of EM-Circuit Problems for Combined Metallic and Dielectric Structures Based on the Augmented Integral Equations

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This paper presents a full-wave triangular mesh based partial element equivalent circuit (PEEC [1]) approach in the frequency domain for combined metal-dielectric structures based on AEFIE [2], A-PMCHWT [3] and E-PMCHWT [4] formulations of the augmented electric field integral equation (A-EFIE). The method avoids so called low frequency breakdown of EFIE [5] **Error! Reference source not found.** and takes into account phase shifts of fields radiated by partial elements. 3D structures are described with equivalent circuit that can be combined with circuit or S-parameter models of electronic components. Validation of the proposed solution is done for toroidal choke in common and differential modes via comparison of obtained results with measurements and with standard MoM in the frequency range from 1Hz to 100MHz. Also, for validation in the high-frequency range, modeling of an Ultra-Wide-Band (UWB) Patch antenna is used. The obtained results confirm the high accuracy of the developed approach in both low and high frequency ranges.

References

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