Abstracts

A Legendre Approximation Method for the Circular Microstrip Disk Problem

The quasi-static solution for the circular microstrip disk is studied using a Galerkin solution to the Fredholm integral equation of the first kind derived by using the Green's function approach. The basis functions are modified Legendre polynomials combined with a reciprocal square root to provide the correct singularity in charge density at the edge of the disk. The integrals involving the singular part of the Green's function are evaluated exactly, the remainder by using Gaussian quadrature. The method is compared in computational efficiency with recent methods based either on a Galerkin approach in the spectral domain, or the use of dual integral equations. Numerical results are given for charge distribution and capacitance; they are compared to exact results and those obtained by others, and the limitations of those methods are discussed. Closed form expressions are given for the capacitance of a disk based on two simple charge distributions.

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