Abstracts

Application of a point-matching MoM reduced scheme to scattering from finite cylinders

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One of the most common methods for the solution of three-dimensional (3-D) scattering problems is the electric-field volume integral equation numerically solved by the application of the method of moments (MoM)-usually the point-matching version. Although simple to formulate, it shows inherent difficulty and complexity because of the 3-D integrals appearing in the interaction matrix elements and of the singularity of the dyadic Green's function (DGF) present in the computation of the self-cell elements. In this paper, a transformation method is presented, which in the case of the point-matching MoM, both reduces the 3-D integrals to two-dimensional (2-D) ones, and also eliminates the need of separate treatment of the singularity while maintaining the same degree of approximation. Comparison to published results is made for the case of scattering by a finite dielectric cylinder. Further examples are presented for scattering by layered dielectric cylinders and lossy cylindrical shells excited by uniform plane waves.

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