Abstracts

A Hybrid Method Solution of Scattering by Conducting Cylinders (TM Case)

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The finite element or finite difference techniques are well known for the solution of Maxwell's equation in differential form. But terminating the mesh accurately at a finite distance from the body in case of an open problem is a major challenge. Previously, the method has been applied for only electrostatic problems. This hybrid method is applied for TM scattering problems and results are documented in this paper. This new approach, as in the electrostatic case, allows for the terminating surface to encapsulate the body very tightly. As before, the finite element technique is used for open region problems whereas the integral equation solution approach using Green's function is applied to enforce the radiation condition. At each iteration cycle, the induced currents on the conducting cylinder are evaluated and their scattered fields at the terminating surface is calculated. Using this method for TM cases, the computational efficiency of the finite element method can be increased. It can be generalized for the case of inhomogeneous and nonlinear media. In this paper numerical results are presented for the solution of Helmholtz's equation to illustrate the accuracy of the technique.

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