Abstracts

Penetration of Fields through a Circular Hole in a Wall of Finite Thickness

R.L. Gluckstern and J.A. Diamond. "Penetration of Fields through a Circular Hole in a Wall of Finite Thickness." 1991 Transactions on Microwave Theory and Techniques 39.2 (Feb. 1991 [T-MTT]): 274-279.

We consider a uniform, static electric field on one side of a plane metallic wall of finite thickness with a circular hole. The field induces a charge distribution on the metallic surface which behaves, at large distances from the hole, as a dipole moment, with different values for the polarizability on the inside (same side as the driving field) and outside surfaces of the hole. We have derived two integral equations for the potential in the hole and constructed variational forms for the "symmetric" and "asymmetric" polarizabilities. Trial functions with adjustable parameters lead to accurate numerical values for the "inside" and "outside" polarizabilities. A similar approach yields corresponding values for the "inside" and "outside" magnetic susceptibilities.

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