

An inverse scattering problem for an electromagnetic layered ellipsoid

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Abstract

In this work the scattering problem of time-harmonic electromagnetic waves from a two-layered obstacle consisting of a triaxial dielectric ellipsoid with a confocal perfectly conducting ellipsoidal core is considered. A low-frequency formulation of the direct scattering problem is described. Based on near-field or far-field data, a measurement matrix is constructed whose eigenvalues and eigenvectors contain information for the size and the orientation of the ellipsoid. The geometrical method described can be applied for solving inverse electromagnetic scattering problems for spheroids, spheres, needle and discs, considering them as geometrically degenerate forms of the ellipsoid for suitable values of the physical and geometrical parameters.
