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Peter Monk* (monk@udel.edu), Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, and **David Colton**. *Inverse Scattering Applied to the Reconstruction of Coated Objects*.

We consider the three dimensional electromagnetic inverse scattering problem of determining information about a coated object from a knowledge of the electric far field patterns corresponding to time harmonic incident plane waves at fixed frequency. We assume that the obstacle is either a perfect conductor coated by a thin dielectric layer or a dielectric coated by a thin layer of a highly conducting material, i.e. the coated portion of the boundary is modeled by either an impedance boundary condition or a conductive boundary condition. No a priori assumption is made on the connectivity of the scattering obstacle nor on the extent of the coating, i.e. the object can be either fully coated, partially coated or not coated at all. We present an algorithm based on the linear sampling method for reconstructing the shape of the scattering obstacle together with an estimate of either the surface impedance or surface conductivity. Numerical examples will be given illustrating method. (Received September 28, 2005)