

## Inverse Electromagnetic Scattering Problems for Partially Coated Objects

**F. Cakoni, D. Colton, and P. Monk**  
University of Delaware, USA

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. To fix our ideas we consider an anisotropic dielectric obstacle (partially) coated by a thin layer of a highly conducting material, which is modelled by a transmission boundary value problem with conducting transmission condition on the coated part. 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 for reconstructing the shape of the scattering obstacle together with an estimate of either the surface impedance or surface conductivity. Numerous numerical examples are given showing the efficaciousness of our method.