

1096-35-2602

Fan Yang* (jackie@math.udel.edu), 501 Ewing Hall, Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, and **Peter Monk** (monk@math.udel.edu), 513 Ewing Hall, Department of Mathematical Sciences, University of Delaware, Newark, DE 19716. *The Interior Transmission Problem for Regions on Conducting Surface.*

We consider the interior transmission problem corresponding to inverse scattering for a bounded isotropic dielectric medium lying on an infinite conducting surface. In particular, we investigate the 2-D scalar case of this problem where, in the corresponding scattering problem, the dielectric medium is illuminated by time harmonic Transverse-Electric (TE) or Transverse-Magnetic (TM) polarized electromagnetic waves respectively. In both cases we establish the Fredholm property for this problem and show that transmission eigenvalues exist and form a discrete set. We also derive Faber-Krahn type inequalities for the transmission eigenvalues. Numerical results for the TE and TM cases are given showing that real transmission eigenvalues can be found from near field data, although in some cases the accuracy requirements on the data is very stringent. (Received September 17, 2013)