A variational approach for the solution of the electromagnetic interior transmission problem for anisotropic media

Fioralba Cakoni
Mathematical Sciences, University of Delaware
cakoni@math.udel.edu

Abstract

The interior transmission problem plays a basic role in the study of inverse scattering problems for inhomogeneous medium. In this paper we study the interior transmission problem for Maxwell's equations in the electromagnetic scattering problem for an anisotropic inhomogeneous object. We introduce a new variational approach to study the solvability of the interior transmission problem and also describe the structure of the corresponding eigenvalues. In addition, we show that under certain assumptions a lower bound on the norm of the (matrix) index of refraction can be obtained from a knowledge of the smallest transmission eigenvalue corresponding to the medium which can be computed from the measured far field data.