

Reconstruction of interfaces using CGO solutions for the Maxwell equations

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In this talk we deal with the problem of reconstructing interfaces using complex geometrical optics solutions for the Maxwell system. The contributions are twofold. First, we justify the enclosure method for the impenetrable obstacle case avoiding any assumption on the directions of the phases of the CGO's (or the curvature of obstacle's surface). In addition, we need only a Lipschitz regularity of this surface. The analysis is based on some fine properties of the corresponding layer potentials in appropriate Sobolev spaces. Second, we justify this method also for the penetrable case, where the interface is modeled by the jump (or the discontinuity) of the magnetic permeability. A key point of the analysis is the global L_p -estimates for the curl of the solutions of the Maxwell system with discontinuous coefficients. These estimates are justified here for p near 2 generalizing to the Maxwell's case the well known Meyers L_p -estimates of the gradient of the solution of scalar divergence form elliptic problems.