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Ting Zhou* (tzhou@math.washington.edu). *Reconstructing Electromagnetic obstacles by the Enclosure method.*

We show that one can determine Perfectly Magnetic Conductor obstacles, Perfectly Electric Conductor obstacles and obstacles satisfying impedance boundary condition, embedded in a known electromagnetic medium, by making electromagnetic measurements at the boundary of the medium. The boundary measurements are encoded in the impedance map that sends the tangential component of the electric field to the tangential component of the magnetic field. We do this by probing the medium with complex geometrical optics solutions to the corresponding Maxwell's equations and extend the enclosure method to this case. Moreover, using complex spherical waves, constructed by the inversion transformation with respect to a sphere, the enclosure method can recover some non-convex part of the obstacle. (Received March 19, 2010)