

Calderon's problem: visibility and invisibility

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This tutorial will introduce the mathematical foundations of electrical impedance tomography (EIT), which consists in determining the electrical properties of a medium by making voltage and current measurements at the boundary of the medium. This inverse problem is also known as Calderon's problem. The tutorial will concentrate on the topic of complex geometrical optics solutions that have led to many advances in the field of inverse problems. We will consider also the question of how make objects invisible to electromagnetic and other kinds of waves. We will concentrate on the topic of "transformation optics" that has led to many theoretical and practical developments in invisibility cloaking. This method arose in constructing counterexamples to Calderon's inverse problem.