

Investigation of Electrical Impedance Tomography Mathematical Properties

Abstract

Electrical Impedance Tomography is an inverse problem which consists in recovering the matrix valued function A in the conductivity equation $\operatorname{div}(\nabla u) = 0$ in a body Ω thanks to measurements of voltages and current $u|_{\partial\Omega}$ on its border $\partial\Omega$. Here u is the electrostatic potential. This problem was stated by Alberto Calderon in 1980.

The aim of this Master's Thesis is to find the minimal conditions in terms of continuity in various cases for the conductivity A which guarantee the satisfaction of some mathematical properties. Here, we will investigate whether there exists a solution u to this equation and whether the conductivity A is stable, assuming we have infinitely many Neumann and Dirichlet data on $\partial\Omega$.