Conductivity reconstruction towards higher genus surfaces

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Abstract

We study the problem of recovering an electrical conductivity from interior power density measurements on a two-dimensional Riemannian manifold. This problem arises in Acousto-Electric Tomography and is motivated by the geometric Calderón problem of recovering the metric from the Dirichlet-to-Neumann map. In contrast to the geometric Calderón problem, we consider a conductive Riemannian manifold and treat the conductivity and metric separately. Assuming that the metric is known, for two-dimensional Riemannian manifolds with genus zero, we highlight in this talk that under certain assumptions on the power density data it is possible to recover the conductivity uniquely and constructively from the data. Furthermore, we address the same problem on a two-dimensional Riemannian manifold with higher genus.