Abstract

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"On the anisotropic Calderón problem with data on disjoint sets"

We show that there is generically non-uniqueness for the anisotropic Calderón problem at fixed frequency when the Dirichlet and Neumann data are measured on disjoint sets of the boundary of a given domain. More precisely, we first show that given a smooth compact connected Riemannian manifold with boundary (M, g) of dimension $n \geq 3$, there exist in the conformal class of g an infinite number of Riemannian metrics $\tilde{g}$ such that their corresponding DN maps at a fixed frequency coincide when the Dirichlet data Γ_D and Neumann data Γ_N are measured on disjoint sets and satisfy $\overline{\Gamma_D \cup \Gamma_N} \neq \partial M$. The conformal factors that lead to these non-uniqueness results for the anisotropic Calderón problem satisfy a nonlinear elliptic PDE of Yamabe type on the original manifold (M, g). We then construct a large class of counterexamples to uniqueness in dimension $n \geq 3$ to the anisotropic Calderón problem at fixed frequency with data on disjoint sets and *modulo this gauge invariance*. This class consists in cylindrical Riemannian manifolds with boundary having two ends (meaning that the boundary has two connected components), equipped with a suitably chosen warped product metric. This is a joint work with Thierry Daudé (Université de Cergy-Pontoise) and Niky Kamran (McGill University).