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Title: A Sharp Regularity Threshold for Riemannian Calderón-type Problems

Summary: We prove a sharp regularity threshold for uniqueness in two anisotropic Calderón-type inverse problems in dimension $n \geq 3$. The main setting is the Riemannian Schrödinger problem with fixed scalar potential: for a prescribed nonconstant analytic function V , we study whether the Dirichlet-to-Neumann map of $-\Delta_g + V$ on a domain $\Omega \subset \mathbb{R}^n$ determines the unknown metric g . The natural gauge is the group of boundary-fixing diffeomorphisms preserving V . We show that, while analytic metrics are uniquely determined modulo this gauge by a minor adaptation of the Lassas-Uhlmann reconstruction theorem, uniqueness fails densely in every non-analytic Gevrey class G^σ with $\sigma > 1$. In fact, our counterexamples are not isometric in the sense that they are not connected by the pushforward of any diffeomorphism of $\overline{\Omega}$. We also prove the analogous sharp threshold for the anisotropic Calder' on problem at fixed nonzero frequency, thereby upgrading the previously known finite-regularity counterexamples to Gevrey and C^∞ regularity. The two constructions use different scalar mechanisms: for fixed potentials, the nonconstant potential itself provides a local coordinate, while at nonzero frequency one uses a compactly supported prescribed-Jacobian lemma in Gevrey spaces. Thus analyticity is the exact threshold for uniqueness in both problems. This is joint work with Thierry Daudé, Alberto Enciso, Bernard Helffer and François Nicoleau.