Local lens rigidity for a class of non-simple manifolds

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Abstract

Let (M, g) be a compact Riemannian manifold with boundary. We study the geodesic ray transform I_Γ of tensor fields over geodesics in an open subset Γ for a class of metrics g that may have conjugate points. Some non-conjugacy assumptions are still imposed. We review some recent results obtained jointly with Gunther Uhlmann. Under the assumptions that $N^*\Gamma$ covers T^*M, and some topological conditions, we show that I_Γ is injective on solenoidal tensors for generic metrics in this class, including the real analytic ones. We also obtain a stability estimate and apply those results to the non-linear lens rigidity problem.