

Support theorems and Inversion formulas for the geodesic ray transform

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Abstract

In this talk, two results regarding the geodesic ray transform are shown. Both are related to the injectivity of this transform.

The first result concerns the support of the geodesic ray transform. Consider a compact Riemannian manifold with boundary such that the boundary is strictly convex and any two points in the manifold can be connected by a unique geodesic. Under the assumption that the metric is real-analytic, it is shown that if the geodesic ray transform of a function vanishes on an appropriate open subset of the space of geodesics, then the function vanishes on the set of points lying on these geodesics.

The second result is a generalization of the inversion formulas for the geodesic ray transform on a class of constant curvature 2-dimensional compact manifolds with boundary. These inversion formulas were given by Pestov and Uhlmann in “On characterization of the range and inversion formulas for the geodesic X-ray transform”. In this talk a generalization of this result will be presented. That is, the inversion formulas given here hold for a class of 2-dimensional manifolds whose curvatures are close to a constant. Moreover, these formulas are given by Neumann series expansions.

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