M. E. Taylor Analysis and PDE Seminar

March 6$^{\text{th}}$
3:30 - 4:30 p.m.
Phillips Hall 385

Recovery of time-dependent coefficients in hyperbolic equations on Riemannian manifolds from partial data

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Abstract. In this talk we discuss inverse problems of determining time-dependent coefficients appearing in the wave equation in a compact Riemannian manifold of dimension three or higher. More specifically, we are concerned with the case of conformally transversally anisotropic manifolds, or in other words, compact Riemannian manifolds with boundary conformally embedded in a product of the Euclidean line and a transversal manifold. With an additional assumption of the attenuated geodesic ray transform being injective on the transversal manifold, we prove that the knowledge of a certain partial Cauchy data set determines time-dependent coefficients of the wave equation uniquely in a space-time cylinder. We shall discuss two problems: (1) Recovery of a potential appearing in the wave equation, when the Dirichlet and Neumann values are measured on opposite parts of the lateral boundary of the space-time cylinder. (2) Recovery of both a damping coefficient and a potential appearing in the wave equation, when the Dirichlet values are measured on the whole lateral boundary and the Neumann data is collected on roughly half of the boundary. This talk is based on joint works with Teemu Saksala (NC State University) and Lili Yan (University of Minnesota).