

Inverse Problems Network Meeting 5

Thursday, 23rd May 2019 - Friday, 24th May 2019

University of Kent

Abstract of Talk

GEOMETRIC AND OBSTACLE SCATTERING AT LOW ENERGY

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We consider scattering theory of the Laplace Beltrami operator on differential forms on a Riemannian manifold that is Euclidean at infinity. The manifold may have several boundary components caused by obstacles at which relative boundary conditions are imposed. Scattering takes place because of the presence of these obstacles and possible non-trivial topology and geometry. Unlike in the case of functions eigenvalues generally exist at the bottom of the continuous spectrum and the eigenforms represent cohomology classes. These eigenforms appear in the expansion of the resolvent, the scattering matrix, and the spectral measure for small spectral parameter λ . We will show that certain cohomology classes can then also be represented as limits of generalised eigenfunctions, and we give formulae for the expansion of the generalised eigenfunctions in any dimension $d > 1$ near 0. In even dimensions the expansion is in terms of λ and $\log \lambda$. The theory of Hahn holomorphic functions is used to describe these expansions effectively.

This is joint work with Alexander Strohmaier.