
EIGENFUNCTION RESTRICTION PROBLEMS

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My talk is about Fourier expansions of restrictions of eigenfunctions on a Riemannian manifold M to a submanifold H , in terms of eigenfunctions of H . This problem originated in automorphic forms in work of Hecke, Maass, Selberg, Roelcke, Rankin and others and further developed by Bruggemann, Kuznecov, Hejhal, Good, Wolpert and Marshall on hyperbolic surfaces. More recently, there are many articles studying L^2 norms of restrictions or their integrals over H against a fixed function. Recently, Wyman, Xi and I have been studying general Fourier coefficients of restrictions with constraints on the ratio of the M -eigenvalue and the H -eigenvalue. Extremes are restrictions of Gaussian beams along a closed geodesic to the geodesic (which have just one non-zero Fourier coefficient of maximal size) or restrictions of ergodic eigenfunctions of negatively curved surfaces to a close geodesic, where one expects all Fourier coefficients in the allowed range to be of the same small size. My talk will review some of the classical results for motivation and then focus on recent (in progress) results at the edge of the Fourier spectrum when H is totally geodesic.