LEVEL SET SHAPE FOR GROUND STATE EIGENFUNCTIONS

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Abstract: In this talk, I will discuss the level sets of the ground state eigenfunction for a class of Schrödinger operators on a convex two dimensional domain. The assumptions on the potential will ensure that the level sets of the eigenfunctions are convex. We will see how to construct two length scales and an orientation of the domain defined in terms of eigenvalues of associated ordinary differential operators. These length scales and orientation will allow us to obtain sufficiently sharp eigenvalue bounds that we can say something about the level sets of the eigenfunction itself. If time permits, I will describe an application to the first Dirichlet eigenfunction of a class of three dimensional convex domains of large eccentricity.