Shared Knowledge Conference

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Eigenfunction Restriction Estimates on Submanifolds

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Abstract

Classical mechanics is governed by Hamilton’s equations. If the particles we are interested in are small enough, however, we then need a more sophisticated machinery in the quantum mechanics sense. With this in mind, we can think of a motion of the small particle as a wave. Hence, the wave equation. With the help of the spectral decomposition, we can reduce our study to the one of the eigenfunctions of the Laplacian. In quantum mechanics, we are interested in $L^2$ estimates of the eigenfunctions, because we want to know where the particle is, by comparing $L^2$ and $L^p$ estimates of the eigenfunctions. The problems of getting the estimates boil down to studying oscillatory integral operators. In this poster, we explain how the study of oscillatory integral operators help us to calculate the $L^2$ to $L^p$ estimates on submanifolds of the ambient manifold, which shows how much the eigenfunctions are concentrated on the submanifolds.