

Quantum resonances and exponential decay.

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Abstract

When k is a resonance for the quantum Hamiltonian $H = -\Delta + V(x)$, one expects that certain solutions of the Schrödinger equation will exhibit certain exponential time decay.

We shall review a method by R. Lavine to prove this fact on the half line $[0, \infty)$ and then study a simple shape resonance model.

We shall also present a strategy to establish almost exponential decay. This is based in estimating, in an explicit manner, the behavior of the Fourier transform of functions resembling a Lorentzian,

$$\frac{1}{\pi} \frac{\epsilon}{(\lambda - \lambda_0)^2 + \epsilon^2}$$

Above is a collaboration with O. Bourget (PUC, Chile), V. Cortés (PUC, Chile) and R. Del Río (UNAM, México).

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