

Quantum Resonators

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Abstract

There is a very clear distinction between scattering states and bound states — $E \geq V_\infty$. However, the boundary between the two becomes vague if the time axis is “extended” from real to complex. In the talk, I will show that under certain circumstances, some states can become amphibious and stationary. And this property leads to some peculiar behavior in the scattering spectrum, namely, resonance. The resonance can be achieved simply by using a qubit as a resonator. Unlike other semiclassical resonators, which resonates at multiple frequencies/energies, the quantum resonator we proposed has only one resonance frequency/energy.