Title:	Level statistics of quasi energy states in a driven double well quantum system: Stabilisation on top of the barrier
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Abstract:	Chaos in a quantum mechanical system is of interest to many scientists. In this thesis, we attempt to broaden our knowledge of chaos in a Quantum mechanical system. Chaotic systems are extremely sensitive to initial conditions in their phase-space trajectories. The uncertainty principle forbids measuring both coordinates and moments concurrently, making it difficult to specify what a phase-space trajectory is for a quantum mechanical system. It follows that classical chaotic notions cannot be directly applied to quantum chaos. An understanding to chaos was formulated by Wigner and Dyson in 1950’s through the Random Matrix Theory (RMT). We analyse the eigen spectra of the Hamiltonian. Here, we use the floquet formalism to solve the TISE in a variety of systems with periodic driving. The periodic driving of a wave packet in a double well potential is investigated. One- dimensional double well potentials are used to simulate physical systems. Numerical simula- tions of the time-independent Schrödinger equation for a symmetric double-well potential are used to examine the spatio-temporal localization of a system in the presence of an oscillating electric field. For an initial state with identical probability densities in both wells, stable localization above the barrier is attainable on a periodic highfrequency drive. This work reviews RMT, its relationship to quantum chaos, and indicators of chaos such as the level spacing statistics and Brody’s distribution index.
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