SOJOURN TIME FOR TIME-DEPENDENT HAMILTONIANS*

ABSTRACT. We study long living solutions for the driven Schrödinger equation,

$$i\frac{\partial u}{\partial t} = H(t)u$$

where $H(t)$ is a time-dependent self-adjoint operator acting on a Hilbert space $\mathcal{H}$. We first establish an energy–time Uncertainty Principle for the solutions, by using the corresponding Floquet operators. This result allows us to exhibit a resonant behavior for a hamiltonian $H(t)$ which is a perturbation of an operator with a bound state. We also consider a quantum mechanical model describing a two-state atom coupled to a time–dependent radiation field. We find explicit lower bounds for the sojourn time which show that this quantity, being finite, is abnormally large.