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Phys 453 project

Time dependent peturbation theory

In the class, we have encountered some physical examples in quantum mechanics that we were able to solve exactly like the simple harmonic oscillator and simplified Hydrogen atom. However, most of the realistic systems cannot be solved exactly, thus we need to use approximation techniques. The most famous one is perturbation theory, when we add the interactions in the Hamiltonian as a small ' perturbation' over the exactly solvable Hamiltonian. We took the time-independent perturbation theory, where these perturbations are independent of time. In this project you shall discover the time-dependent theory. Read the advised references and summarise your understanding of time-dependent perturbation theory in the following points:

1. Why T-D perturbation theory ?
2. Overview of the theory
3. Examples
4. Further applications

You should include the references in your project
○ Michael G. Moore, Time-Dependent Perturbation Theory (2009)
○ Zettili N. Quantum mechanics: Concepts and Applications (2001)

Best Regards,

Dr Salwa Alsaleh