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Phys 453 project

WKB Method

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 learn a different technique for approximation, invented by Wentzel Kramers Brillouin or (WKB) method. This method is also helpful in studying the semi-classical approximation.

1. WKB method overview
2. The semi-classical limit
3. Examples

You should include the references in your project

- Shinn J. , Perturbation Theory and the WKB Method (2010)
- Griffts Introduction to Quantum mechanics (1994) Chapter 8.

Best Regards,

Dr Salwa Alsaleh