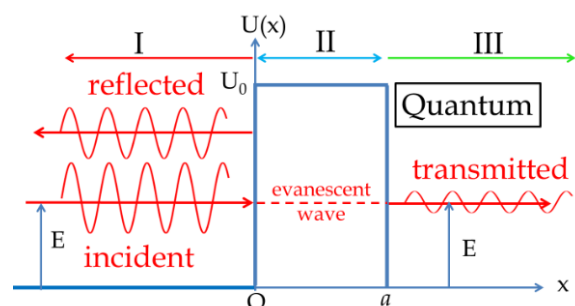
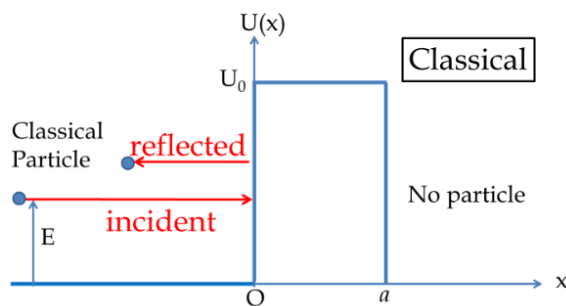
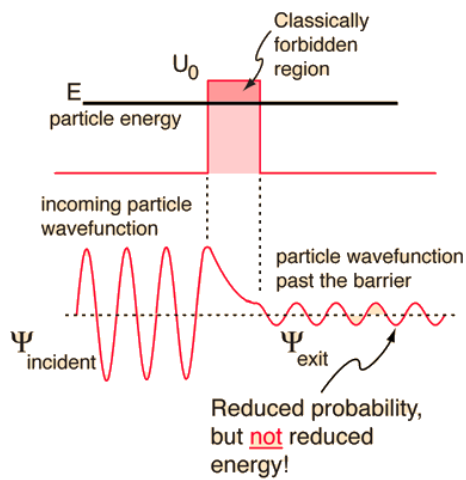
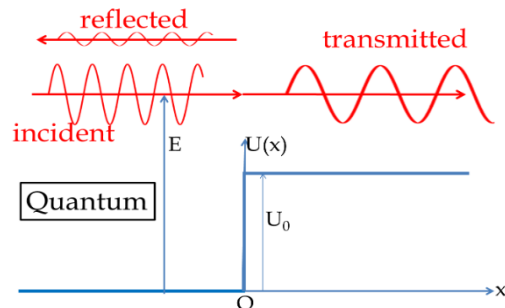
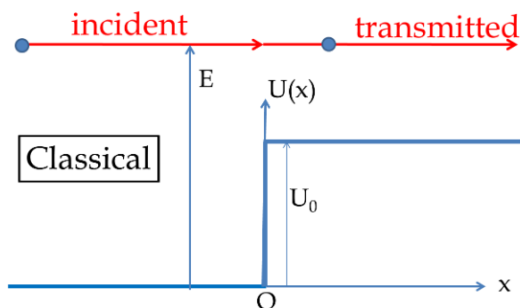


- Schrödinger equation
- 1D Potentials: Tunnel effect and quantum reflection, periodic potentials (energy bands)
- Position and momentum operators, commutation rule
- Heisenberg uncertainty principle
- Harmonic oscillator
- Ladder operators
- Heisenberg equation
- Central potentials: spherical harmonics and radial equation
- Angular momentum operators and spin
- Composition of angular momenta
- Time-independent perturbation theory: 1st and 2nd order
- Hydrogen atom: Coulomb part + Fine structure + Hyperfine structure

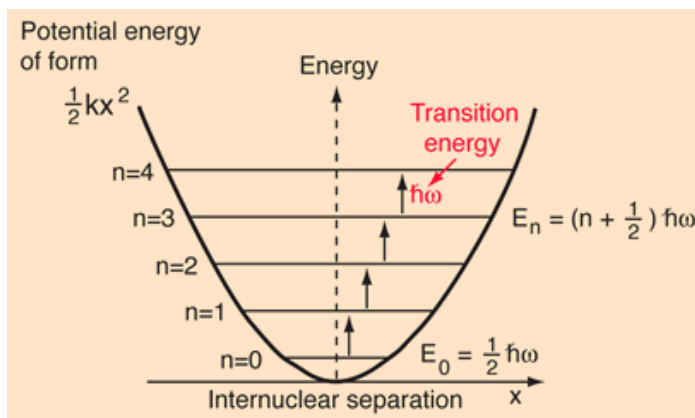
Quantum Tunneling:



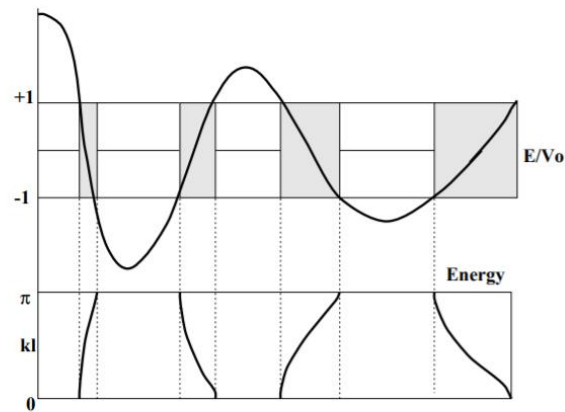
Quantum Reflection:



Harmonic Oscillator:



Periodic Potentials (Energy Bands):



Graph of function arising from multiple square-well problem: Allowed energy solutions exist only where $|\cos kl| \leq 1$.

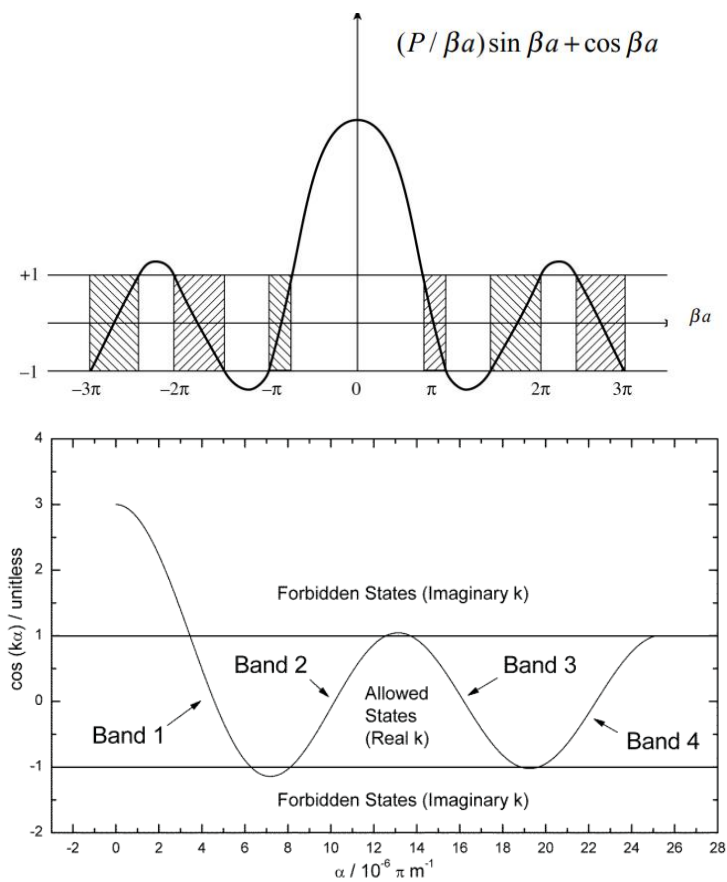


Figure 7: Alternating Kronig-Penney model forbidden and allowed electron energy states.⁴³

