

10.1: Correspondence between time-dependent and time-independent solutions

The time dependent Schrödinger equation is

$$-\frac{\hbar^2}{2m} \frac{\partial^2}{\partial x^2} \psi(x, t) + V(x) \psi(x, t) = \frac{\hbar i \partial}{\partial t} \psi(x, t). \quad (10.1.1)$$

As we remember, a solution of the form

$$\psi(x, t) = \phi(x) e^{-iEt/\hbar} \quad (10.1.2)$$

leads to a solution of the time-independent Schrödinger equation of the form

$$-\frac{\hbar^2}{2m} \frac{\partial^2}{\partial x^2} \phi(x) + V(x) \phi(x) = E \phi(x) \quad (10.1.3)$$

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