

72. The wave function is now given by

$$\Psi(x, t) = \psi_0 e^{-i(kx + \omega t)} .$$

This function describes a plane matter wave traveling in the negative x direction. An example of the actual particles that fit this description is a free electron with linear momentum $\vec{p} = -(\hbar k/2\pi)\hat{i}$ and kinetic energy $K = p^2/2m_e = \hbar^2 k^2/8\pi^2 m_e$.