Answer on Question #37530, Physics, Quantum Mechanics

Task:

DEFINE REFLECTION AND TRANSMISSION COEFFICIENT

The answer:

Suppose, in the one-dimensional case we have the potential barrier $U(x)$. Left on barrier swoops particle flux density of probability j_0. Let j_1 part of this flow describes the movement of particles after reflection from the barrier and j_2 - a stream to the right of the barrier. According to the law of conservation of flow

$$j_0 = j_1 + j_2$$

Enter the following values

$$D = \frac{j_2}{j_0}$$

What we call the transmission coefficient through the barrier , and

$$R = \frac{j_1}{j_0}$$

which will be called the reflection coefficient of the barrier. Obviously, the

$$D + R = 1$$

Flux density of probability is calculated by the general formula

$$j = \frac{\hbar}{2mi}\left(\psi^*(x)\frac{d\psi(x)}{dx} - \psi(x)\frac{d\psi^*(x)}{dx}\right)$$

Where $\psi(x)$ - the wave function of a particle , m - mass of the particle , i - the imaginary unit , $\hbar$ - Planck's constant . To calculate the values of R and D necessary to find the wave function of the particle to the left of the barrier to the right of him and in the barrier based on the continuity of the wave function and its first derivative .