

3.2: Operators

Notice that in deriving the wave equation we replaced the number p or k by a differential acting on the wavefunction. The energy (or rather the Hamiltonian) was replaced by an "operator", which when multiplied with the wave function gives a combination of derivatives of the wavefunction and function multiplying the wavefunction, symbolically written as

$$\hat{H}\psi(x, t) = -\frac{\hbar^2}{2m} \frac{\partial^2}{\partial x^2} \psi(x, t) + V(x)\psi(x, t). \quad (3.2.1)$$

This appearance of operators (often denoted by hats) where we were used to see numbers is one of the key features of quantum mechanics.

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