

Fundamentale ligninger

Schrödingerligningen

$$i\hbar \frac{\partial \Psi}{\partial t} = H\Psi$$

Tidsuafhængige Schrödingerligning

$$H\psi = E\psi, \quad \Psi = \psi e^{-iEt/\hbar}$$

Hamiltonoperator

$$H = -\frac{\hbar^2}{2m} \nabla^2 + V$$

Impulsoperator

$$\mathbf{p} = -i\hbar\nabla$$

Tidsafhængighed af forventningsværdi

$$\frac{d\langle Q \rangle}{dt} = \frac{i}{\hbar} \langle [H, Q] \rangle + \left\langle \frac{\partial Q}{\partial t} \right\rangle$$

Generaliseret usikkerhedsrelation

$$\sigma_A \sigma_B \geq \left| \frac{1}{2i} \langle [A, B] \rangle \right|$$

Heisenbergs usikkerhedsrelation

$$\sigma_x \sigma_p \geq \hbar/2$$

Kanonisk kommutator

$$[x, p] = i\hbar$$

Angulært moment

$$[L_x, L_y] = i\hbar L_z, \quad [L_y, L_z] = i\hbar L_x, \quad [L_z, L_x] = i\hbar L_y$$

Paulimatrixer

$$\sigma_x = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \quad \sigma_y = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}, \quad \sigma_z = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$$

Fundamentale konstante