

§ Quantum Mechanics in three dimension David J. Griffiths

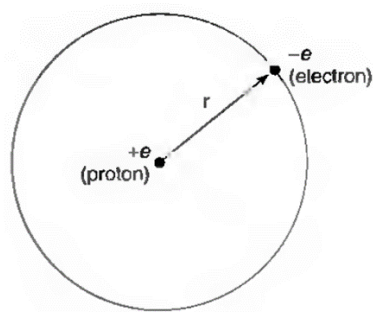
4.1 The Schrodinger equation in spherical coordinates

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

1. H : Hamiltonian operator
2. Ehrenfest theorem for 3-dimension
3. Heisenberg uncertainty principle
4. Rodrigues formula
5. Associated Legendre polynomial/function
6. Spherical harmonic functions $Y_l^m(\theta, \phi)$
7. The Radial equation
8. The spherical Bessel function the spherical Neumann function

$$j_l(x) = (-x)^l \left(\frac{1}{x} \frac{d}{dx} \right)^l \frac{\sin x}{x}, n_l(x) = -(-x)^l \left(\frac{1}{x} \frac{d}{dx} \right)^l \frac{\cos x}{x}$$

§ 4.2 The hydrogen atom



4.2.1 The radial wave function

The Bohr formula

1. Associated Laguerre polynomial

§ 4.3 Angular momentum

4.3.1 Eigenvalues

4.3.2 Eigenfunctions

§ 4.4 Spin

4.4.2 Electron in a magnetic field