

## Magnetic properties of materials

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### Part 3. Measurements and applications

$$F = -\frac{dU}{dz} = m \cdot \frac{dB}{dz} \quad (3.1)$$

$$F = \frac{\chi V B}{\mu_0} \frac{dB}{dz} \quad (3.2)$$

$$\delta F_z = \frac{\chi A \delta z B}{\mu_0} \frac{dB}{dz} \quad (3.3)$$

$$dF_z = \frac{\chi A}{2\mu_0} \frac{d(B^2)}{dz} dz \quad (3.4)$$

$$F_z = \int dF_z = \frac{\chi A}{2\mu_0} (B_1^2 - B_2^2) \quad (3.5)$$

$$F_z = \frac{\chi A}{2\mu_0} B_1^2 \quad (3.6)$$

$$\Delta\phi = \frac{q\Phi}{\hbar} \quad (3.7)$$

$$\Phi = \frac{nh}{q} = \frac{nh}{2e} = n\Phi_0 = 2 \times 10^{-15} \text{ Weber} \quad (3.8)$$

$$\mathbf{F} = q(\mathbf{v} \times \mathbf{B}) \quad (3.9)$$