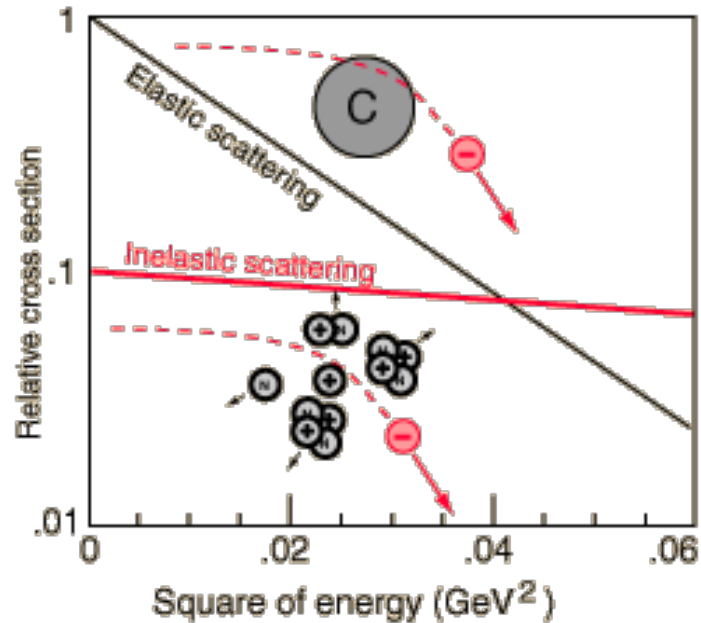
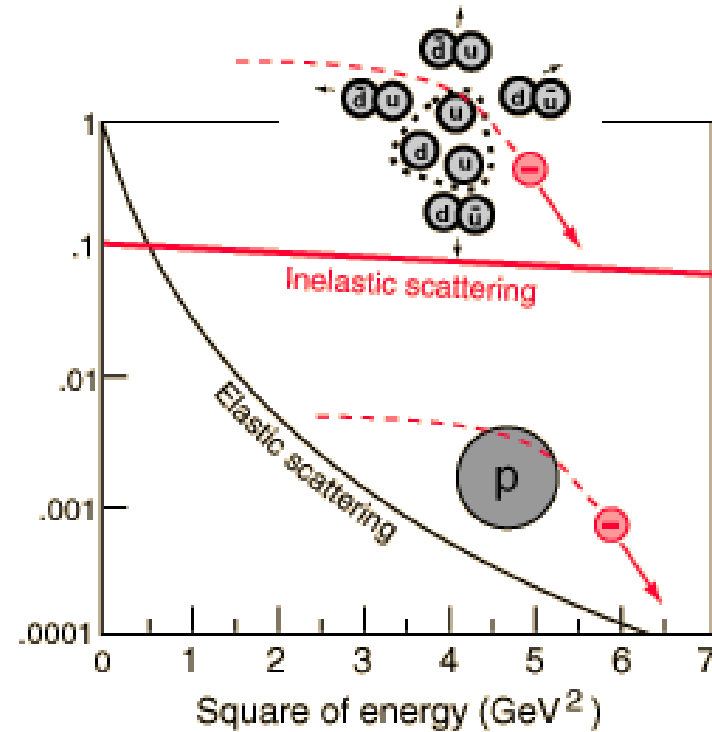


Espalhamento de elétrons

Electron scattering from carbon atom



Electron scattering from proton



Fator de forma de espalhamento de elétrons

Densidade de matéria

$$\rho(\vec{r}) = \sum_{i=1}^A |\psi_i(\vec{r}, s, t)|^2$$

Densidade de carga

$$\rho_{ch}(\vec{r}) = Z \rho(\vec{r})$$

Fator de forma

- Transformada de Fourier da densidade

$$F(\vec{q}) = \int \rho_{ch}(\vec{r}) e^{i\vec{q} \cdot \vec{r}} dV$$

- Caso esfericamente simétrico (ou dep. radial média)

$$F(q^2) = \frac{4\pi}{q} \int_0^{\infty} \rho_{ch}(r) \sin(qr) r dr$$

Relação com a seção de choque

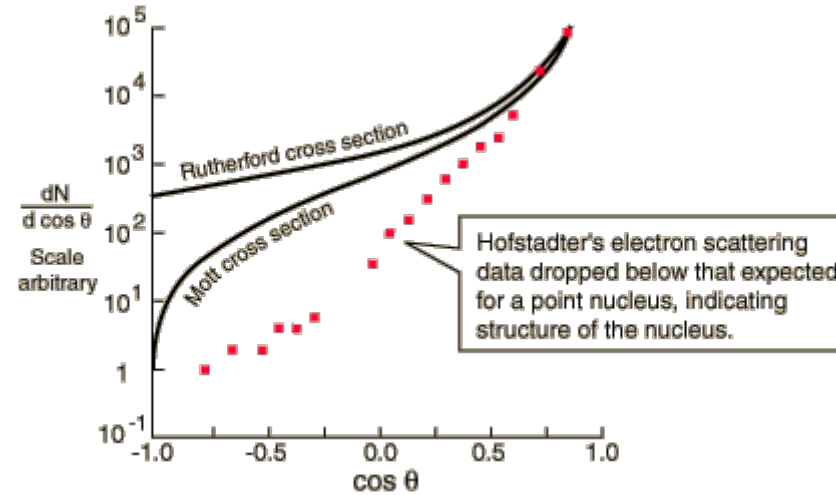
- Espalhamento elástico de elétrons

$$\frac{d\sigma}{d\Omega} = \left(\frac{d\sigma}{d\Omega} \right)_{point} |F(q^2)|^2$$

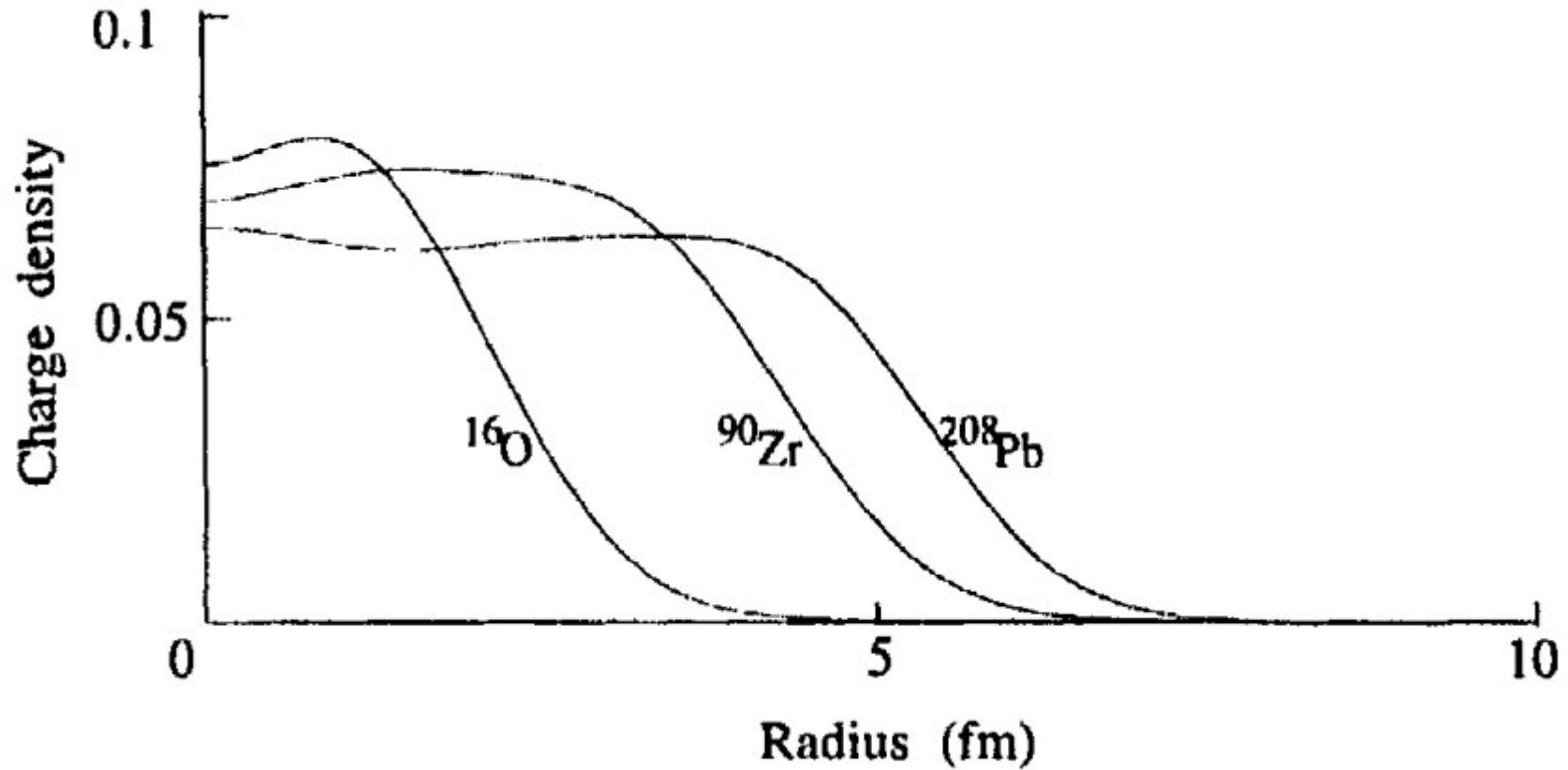
- Transformada inversa

$$\rho_{ch}(r) = \frac{1}{2\pi^2 r} \int_0^\infty F(q^2) \sin(qr) q dq$$

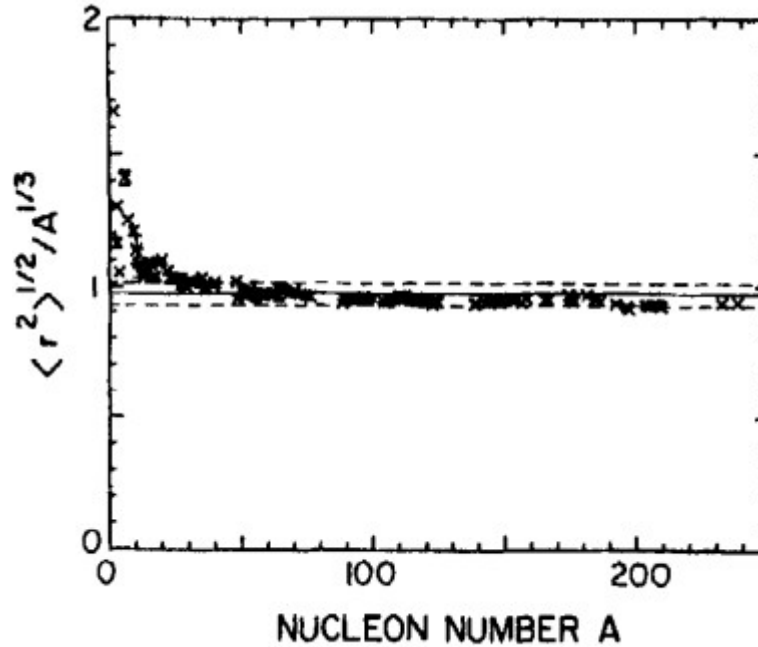
Mott x Rutherford x estrutura



Densidades de carga



Raio quadrático médio



Fator de forma e densidade de carga dos núcleons

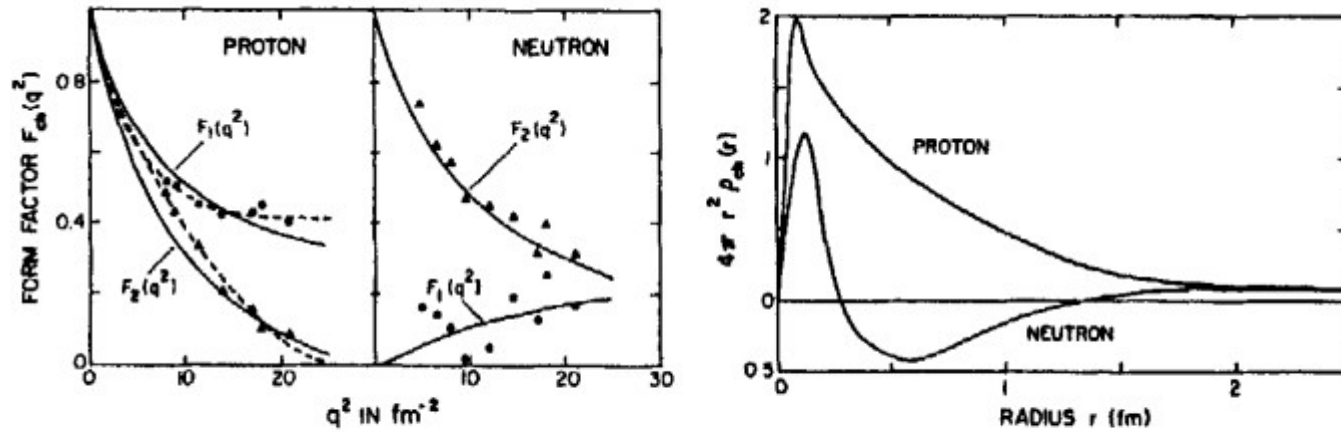


Figure 4-3: Dirac and Pauli form factors and charge distributions of proton and neutron. (Adapted from Refs. [85] and [98].)