

(12.8) Calculate the mass of an electron accelerated through a potential of $2 \cdot 10^8$ V.

Some constants and useful units:

$$MeV := 1.60217733 \cdot 10^{-13} \cdot \text{joule} \quad amu := 1.6605402 \cdot 10^{-27} \cdot \text{kg} \quad m_{0e} := 5.4857990 \cdot 10^{-4} \cdot amu$$

The resulting energy according to the text: $E_e := 2 \cdot 10^8 \cdot 10^{-6} \cdot MeV$

Relativistic calculations:

$$\Delta m_e := \frac{E_e}{931.5 \cdot \frac{MeV}{amu}}$$

From $E = m \cdot c^2$ e.g. eqn. (12.2)

$$m_e := m_{0e} + \Delta m_e$$

$$m_e = 0.2153 \cdot amu$$

$$m_e = 3.57 \cdot 10^{-28} \cdot \text{kg}$$