

1 Charge on circular orbit

- An electron is moving with constant velocity v_o on a circular orbit of radius R_o . Calculate the amount of energy per cycle that it takes to keep the electron on its orbit. Evaluate the result for $R_o = 100m$ and for $R_o = 1000m$.
- The classical model of the hydrogen atom pictured an electron moving in a stationary circular orbit around a proton. For the first Bohr orbit of $R_o = 0.53 \cdot 10^{-10}m$ calculate approximately the radiated power and estimate how long and how many cycles it would take until the atom collapses.

2 Deceleration of Charge

- An electron with initial energy of $100kV$ is brought to rest by being uniformly decelerated along the direction of initial motion. Calculate the total energy radiated during the deceleration process and the angular distribution of the radiated energy.

Hint: $T = m_e c^2 \left[(1 - v_o^2/c^2)^{-1/2} - 1 \right]$.