

Projectile Motion in Electric Field



- electrostatic force: $F_x = 0$ $F_y = -eE$
- equation of motion: $\vec{F} = m_e \vec{a}$
- acceleration: $a_x = 0$ $a_y = -\frac{e}{m_e} E \equiv -a$
- velocity: $v_x(t) = v_0 \cos \theta$ $v_y(t) = v_0 \sin \theta - at$
- position: $x(t) = v_0 [\cos \theta] t$ $y(t) = v_0 [\sin \theta] t - \frac{1}{2} at^2$

- height: $h = \frac{v_0^2}{2a} \sin^2 \theta$

- range: $R = \frac{v_0^2}{a} \sin(2\theta)$

