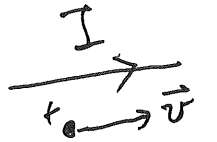
τ (tau)

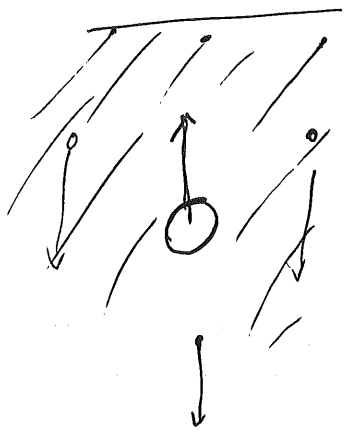
Q_0 and τ are constant.

$$\rightarrow Q = Q_0 e^{-t/\tau}.$$

$$I = \frac{dQ}{dt} = -\frac{Q_0}{\tau} e^{-t/\tau}.$$



||



$e^- \longrightarrow 10^6$ m/s. (1% of speed of light)

↑

Fermi velocity.

Making $\sim 10^{14}$ collisions per sec with the lattice.

$$I = n e v_d A$$

$$J = \frac{I}{A} = n e v_d$$

↑

$v_d \propto E$

$J \propto E$ — Ohm's Law

$E = \rho J \Rightarrow J = \frac{E}{\rho}$ ← NOT charge density.

↑

resistivity. property of the material

$\frac{1}{\rho} = \sigma$ = Conductivity

$$\Omega = \frac{V}{A} = \frac{J/C}{C/s}$$

$$= \frac{Js}{C^2}$$

$$= \frac{Kg\,m^2/s^2 \cdot s}{C^2}$$

$$= \frac{Kg\,m^2}{sC^2}$$

~~$\frac{1}{2}mv^2 = qV$~~

$$R = \frac{\rho L}{A} \Rightarrow \rho = \frac{RA}{L}$$

$$[\rho] = \frac{\Omega\, m^2}{m} = \Omega m$$