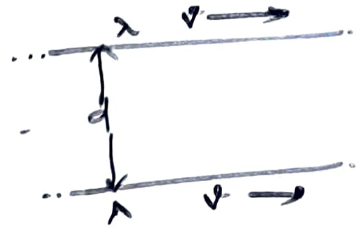
Suppose you have two infinite straight line charge λ, a distance 'd' apart and moving along at a constant speed v. How great would v have to be inorder for the magnetic attraction to balance the electric repulsion?



2 Infinite line charge density moving with a velocity equals current I moving in the direction of 'v'.

Magnetic force per unit length.

$$\vec{F}_B = \frac{\mu_0}{2\pi}\frac{I_1 I_2}{d}$$

$$= \frac{\mu_0}{2\pi}\frac{I^2}{d} = \frac{\mu_0}{2\pi}\frac{\lambda^2 v^2}{d}$$

$$\boxed{I = \lambda V}$$

Electric Field on one wire

$$E = \frac{\lambda}{2\pi\varepsilon_0 d}$$

Electric force per unit length

$$\vec{F_E} = \frac{\lambda q}{2\pi\varepsilon_0 d\, l} = \frac{\lambda^2}{2\pi\varepsilon_0 d}.$$

When the magnetic attraction balances the electric repulsion,

$$\vec{F_E} = \vec{F_B}$$

$$\cancel{\frac{\mu_0}{2\pi}\lambda^2} \quad \frac{\lambda^2}{2\pi\varepsilon_0 d} = \frac{\mu_0}{2\pi}\frac{\lambda^2 v^2}{d}$$

$$v^2 = \frac{1}{\varepsilon_0\mu_0} = \frac{1}{\sqrt{\varepsilon_0\mu_0}} = c$$

which is the speed of light and moving the wire at this speed is impossible

which implies, Electric force always dominates over magnetic force.