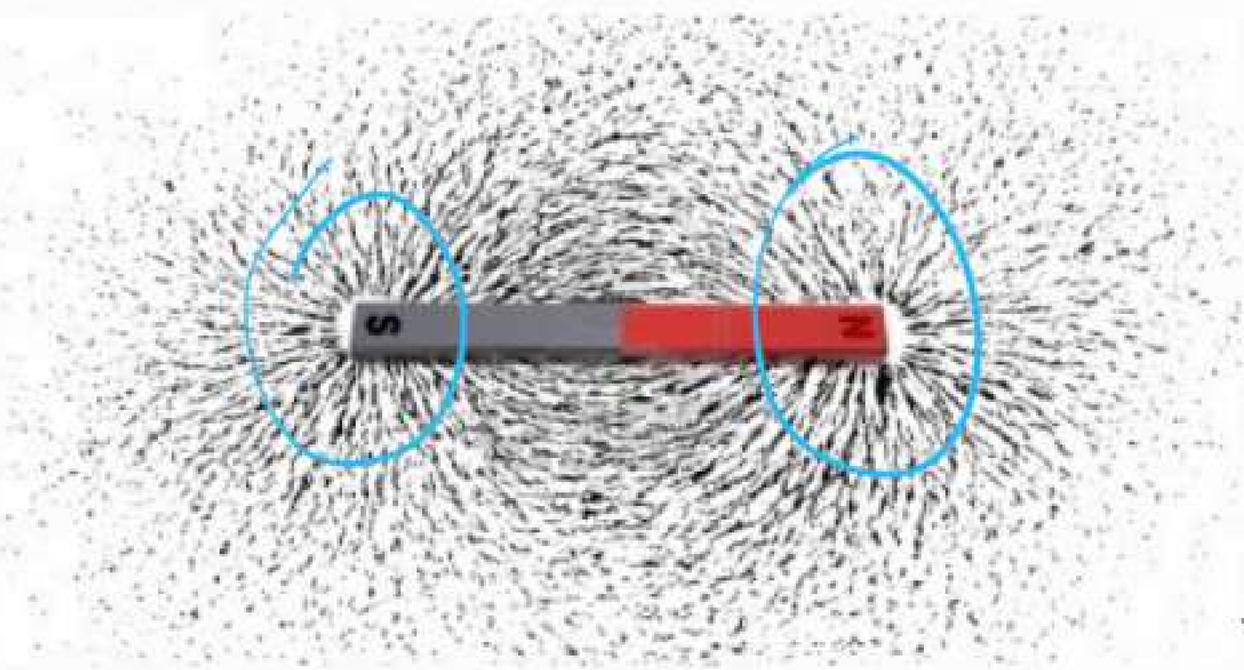


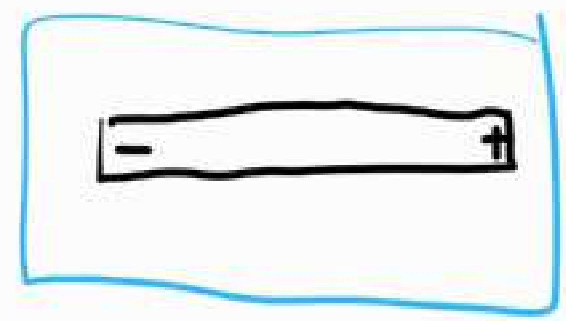
1) $+$ $\quad$ $-$

2) $\leftarrow +$ $\quad$ $+ \rightarrow$

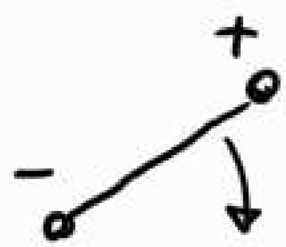
$\leftarrow -$ $\quad$ $- \rightarrow$

$+ \rightarrow \leftarrow -$

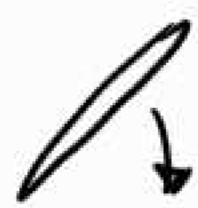
3)



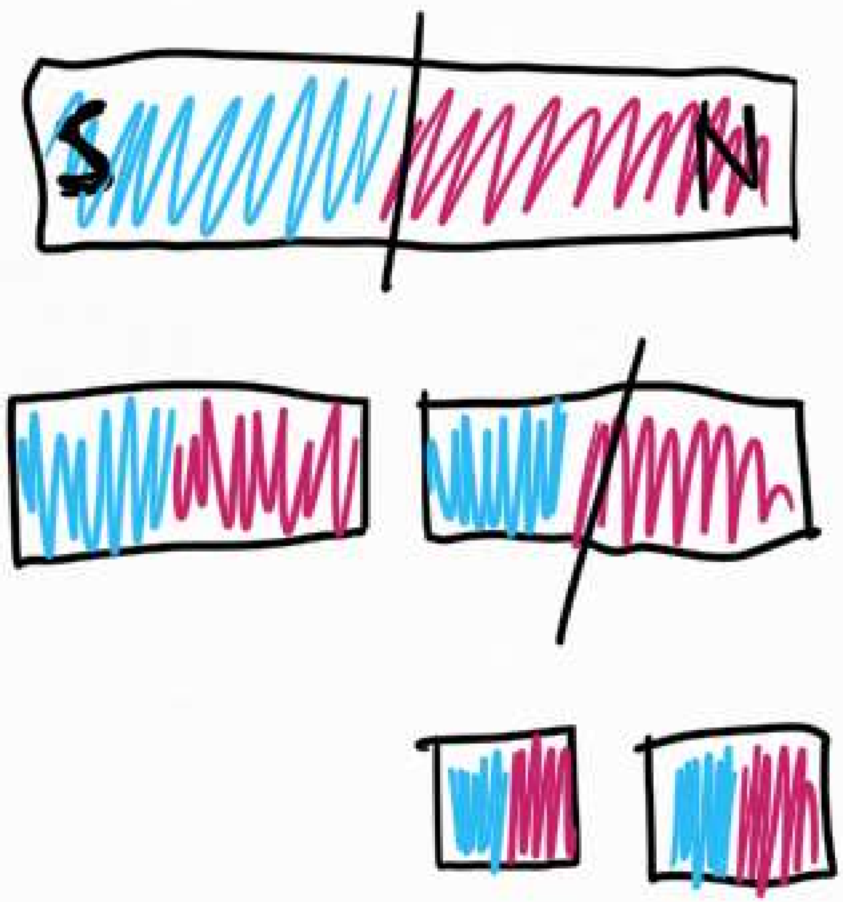
$\vec{E}$ $\quad$ $\vec{B} \rightarrow N$



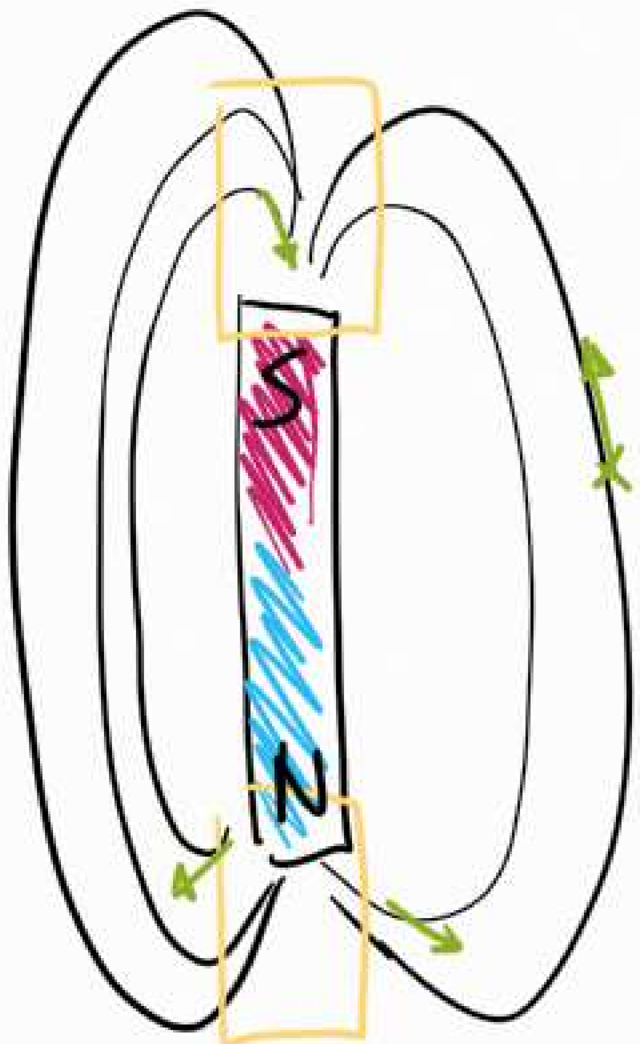
$\longleftrightarrow$

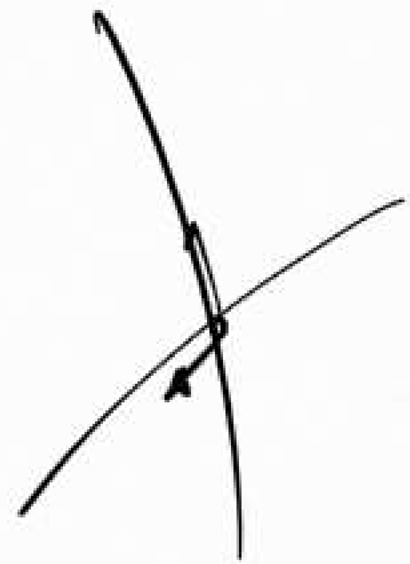


$F \sim \frac{1}{r^2}$



$\vec{B}$, $\vec{H}$

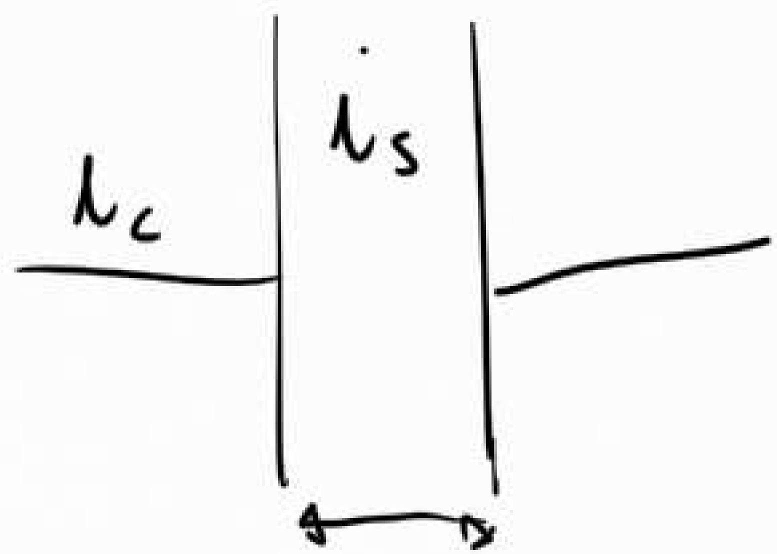




$$\vec{F}_e = q\vec{E}$$

$$\cancel{\vec{B}(t) \to \vec{E}}$$

$$\vec{E}(t) \to \vec{B}$$



$\vec{F}_L = q\vec{v} \times \vec{B}$

FORZA DI LORENTZ

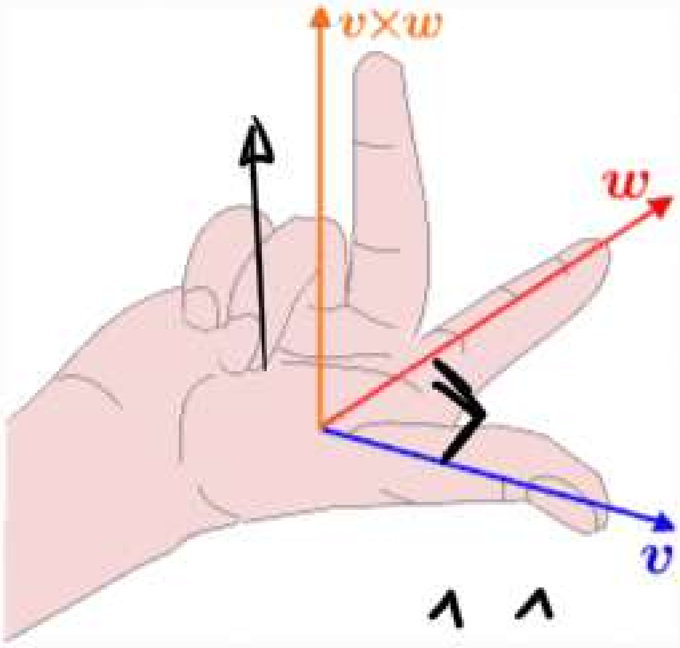
$\downarrow$

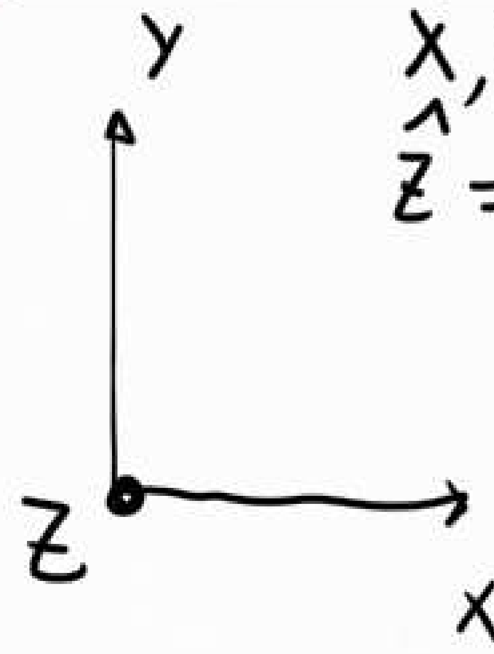
① $|\vec{F}_L| = F_L = qvB\sin\theta$

se $\vec{v} \parallel \vec{B} \Rightarrow \vec{F}_L = 0$

② $\vec{a} \times \vec{b} = \vec{c}$, $\vec{c} \perp \vec{a}$, $\vec{c} \perp \vec{b}$

③ $\vec{a} \times \vec{b} = -\vec{b} \times \vec{a}$





$\hat{x}, \hat{y}$

$\hat{z} = \hat{x} \times \hat{y}$

$\vec{c} \perp \vec{a}, \quad \vec{c} \perp \vec{b}$

$\Downarrow$

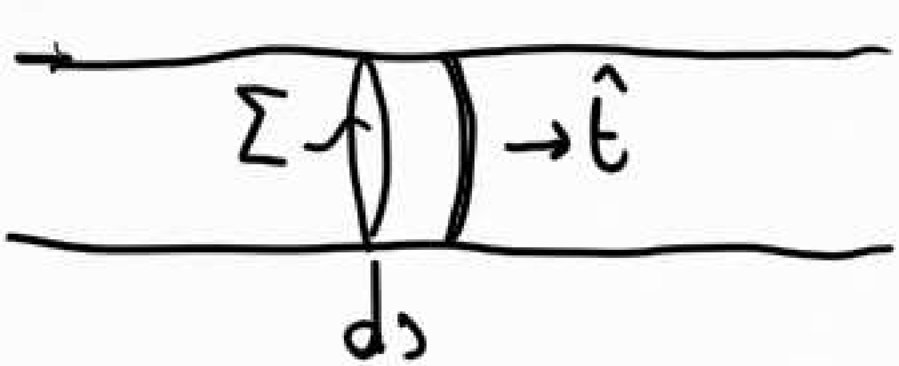
$\vec{F}_L \perp \vec{v} \parallel d\vec{s} \Rightarrow \vec{F}_L \perp d\vec{s} \Rightarrow$

$$W = \int_A^B \vec{F}_L \cdot d\vec{s} = 0 = \Delta U_K = \frac{1}{2} m v_B^2 - \frac{1}{2} m v_A^2 = 0$$

$$\boxed{v = \text{cost}}$$

$$[B] = \frac{[F]}{[q][v]} = \frac{N}{C} \frac{s}{m} = \frac{Kg}{A s^2} = T, \quad G = 10^{-4} T$$

$$B_T \sim 0.4 G$$



$$\vec{v}_d,\ -e,\ n,\ \vec{J} = -ne\,\vec{v}_d,\ i = J\Sigma$$

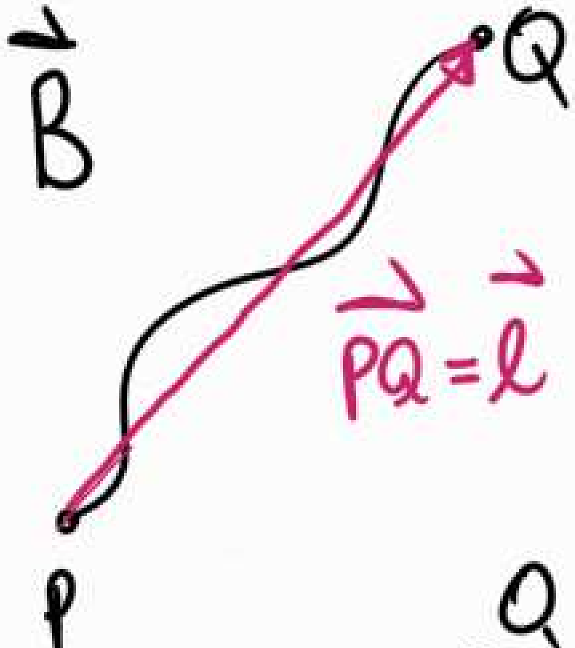
$$\vec{F}_L = -e\,\vec{v}_d \times \vec{B}, \quad d\vec{F} = dN_e\,\vec{F}_L = n\,d\tau\,\vec{F}_L = n\,\Sigma\,ds\,\vec{F}_L =$$

$$= \underline{-ne\,\vec{v}_d} \times \vec{B}\,\Sigma\,ds = \vec{J} \times \vec{B}\,\Sigma\,ds =$$

$$= J\,\hat{t} \times \vec{B}\,\Sigma\,ds = i\,\underline{ds\,\hat{t}} \times \vec{B} = \boxed{i\,d\vec{s} \times \vec{B}}$$

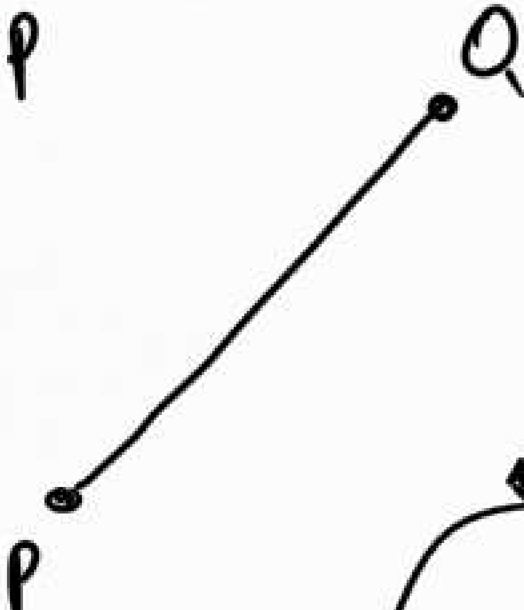
II legge elementare di Laplace

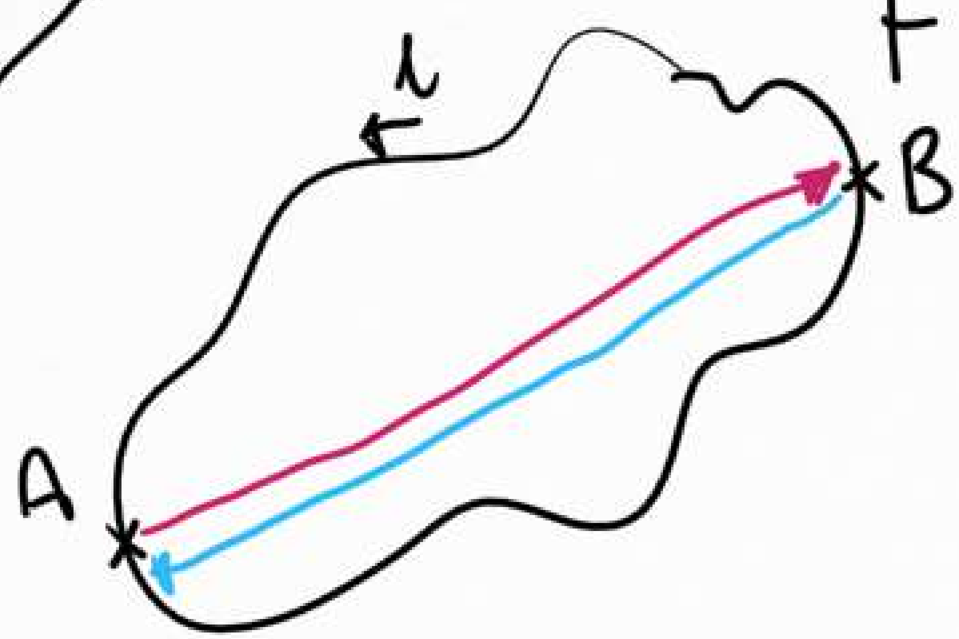
$$\vec{F} = \int_P^Q i\,d\vec{s} \times \vec{B} = i \int_P^Q d\vec{s} \times \vec{B}$$



$$\vec{F} = i\int_P^Q d\vec{s} \times \vec{B} = i\left(\int_P^Q d\vec{s}\right) \times \vec{B} = i\,\vec{PQ} \times \vec{B} =$$

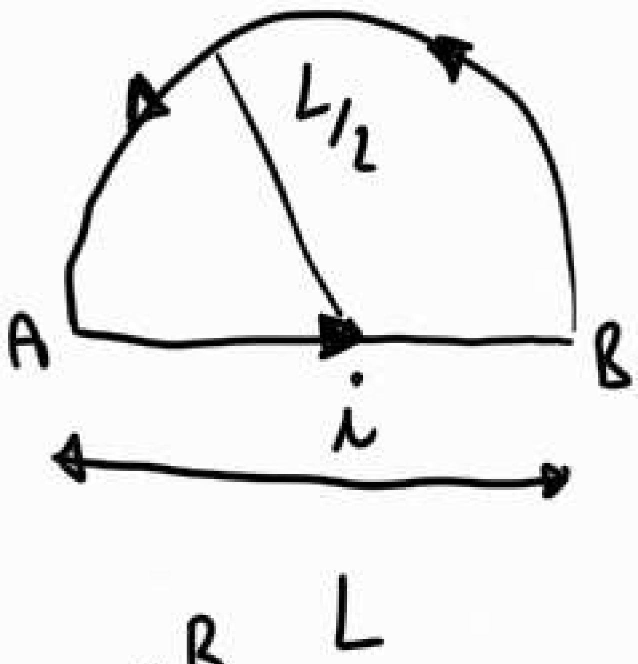
$$= i\,\vec{l} \times \vec{B}$$

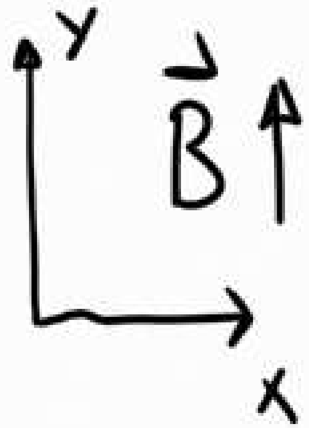




$$\vec{F} = 0 = i\oint d\vec{s} \times \vec{B} = i\int_A^B d\vec{s} \times \vec{B} +$$

$$+\, i\int_B^A d\vec{s} \times \vec{B} = 0$$





$$\vec{B}\uparrow \qquad \vec{F} = i\int_A^B d\vec{s} \times B + i\int_B^A d\vec{s} \times \vec{B}$$

$$i\int_A^B d\vec{s} \times \vec{B} = i\int (\hat{x}\,dx) \times \vec{B} = i\int_0^L \hat{z}\,B\,dx = iBL\,\hat{z}$$

$$i\int_B^A d\vec{s} \times \vec{B}, \quad d\vec{s} = -\hat{x}\,dx \pm \hat{y}\,dy, \quad \hat{y} \parallel \vec{B}$$

$$d\vec{s} \times \vec{B} = \left(-\hat{x} \times \vec{B}\,dx \pm \cancel{\hat{y} \times \vec{B}\,dy}\right) = -\hat{x} \times \vec{B}\,dx =$$

$$d\vec{s} \times \vec{B} = -\hat{z} B\, dx \implies$$

$$i\int_0^L (-\hat{z} B\, dx) = -iBL\hat{z} \implies$$

$$\vec{F} = iBL\hat{z} - iBL\hat{z} = 0$$