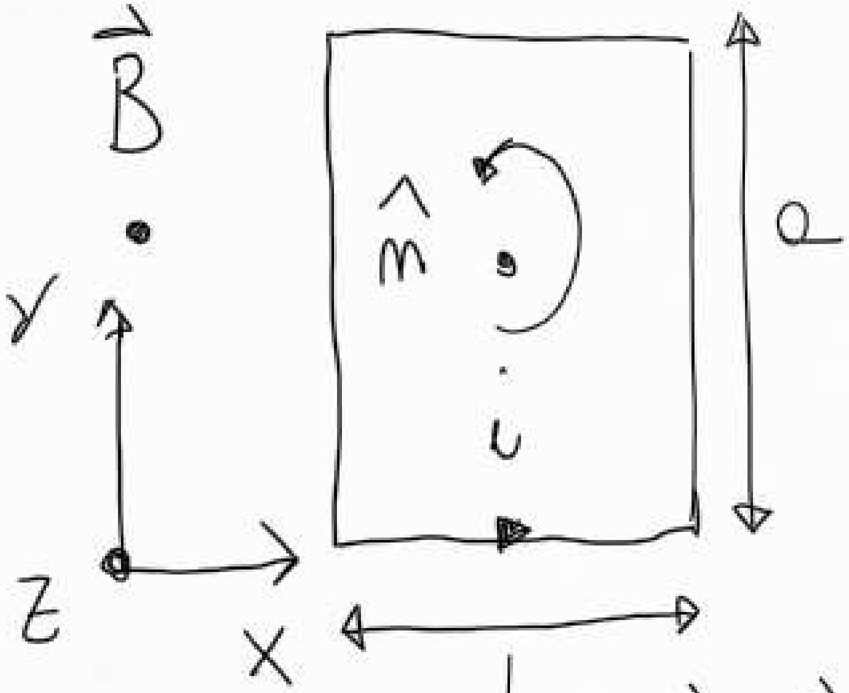
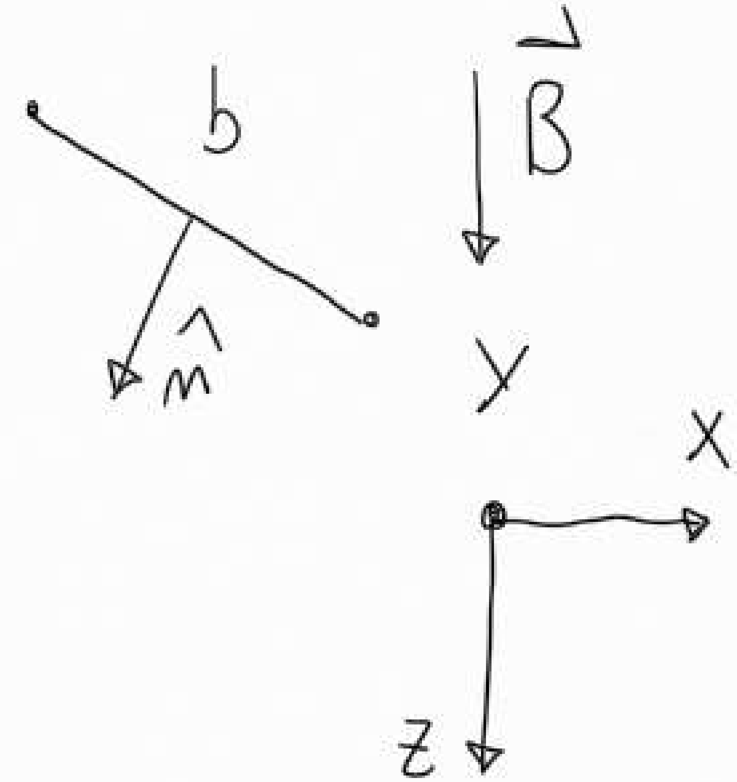
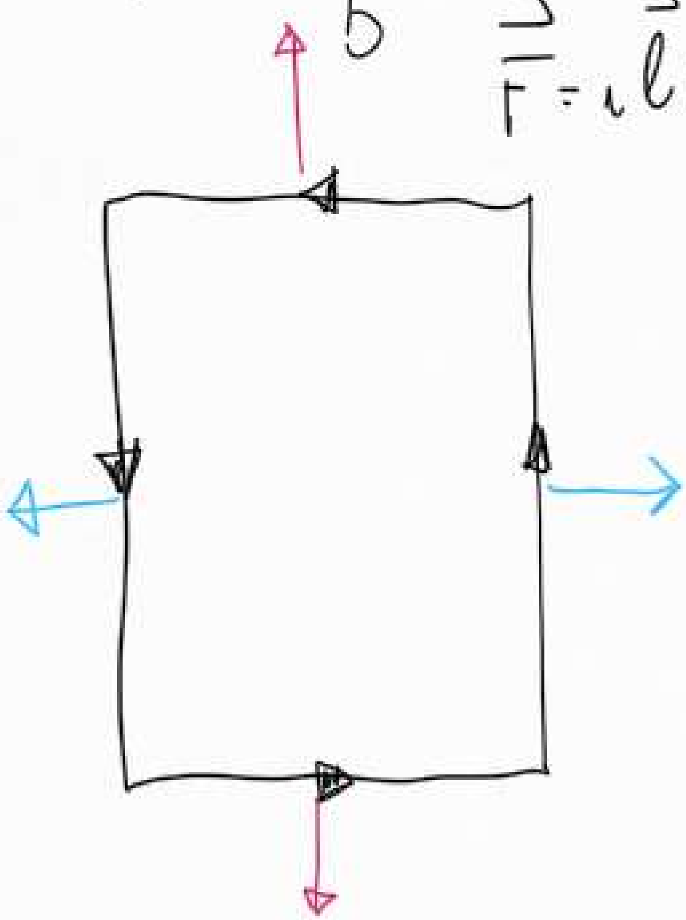
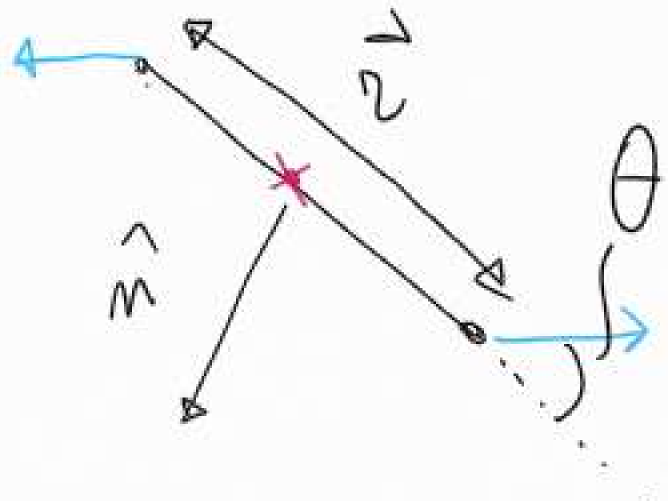


$\vec{F} = i\,\vec{l} \times \vec{B}$







$$\vec{M} = \hat{r} \times \vec{F}$$

$$|\vec{r} \times \vec{F}| = r F \sin\theta =$$

$$= b\, i\, a B \sin\theta =$$

$$= i \Sigma B \sin\theta =$$

$$= |\vec{m} \times \vec{B}|$$

dove

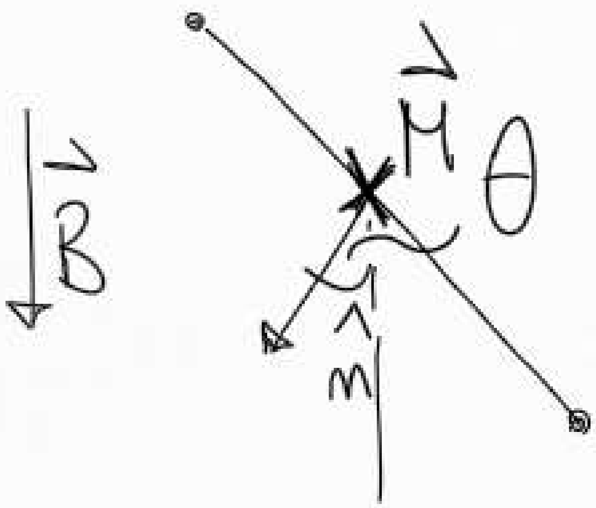
$$\boxed{\vec{m} = i \Sigma \hat{n}} \Rightarrow$$

$$\vec{M} = \vec{m} \times \vec{B} \Rightarrow$$

$$\vec{M} = \vec{m} \times \vec{B} \quad , \quad \vec{m} = i \sum \hat{n} \quad , \quad \vec{U}_e = - \vec{m} \cdot \vec{B} = - m B \cos\theta$$

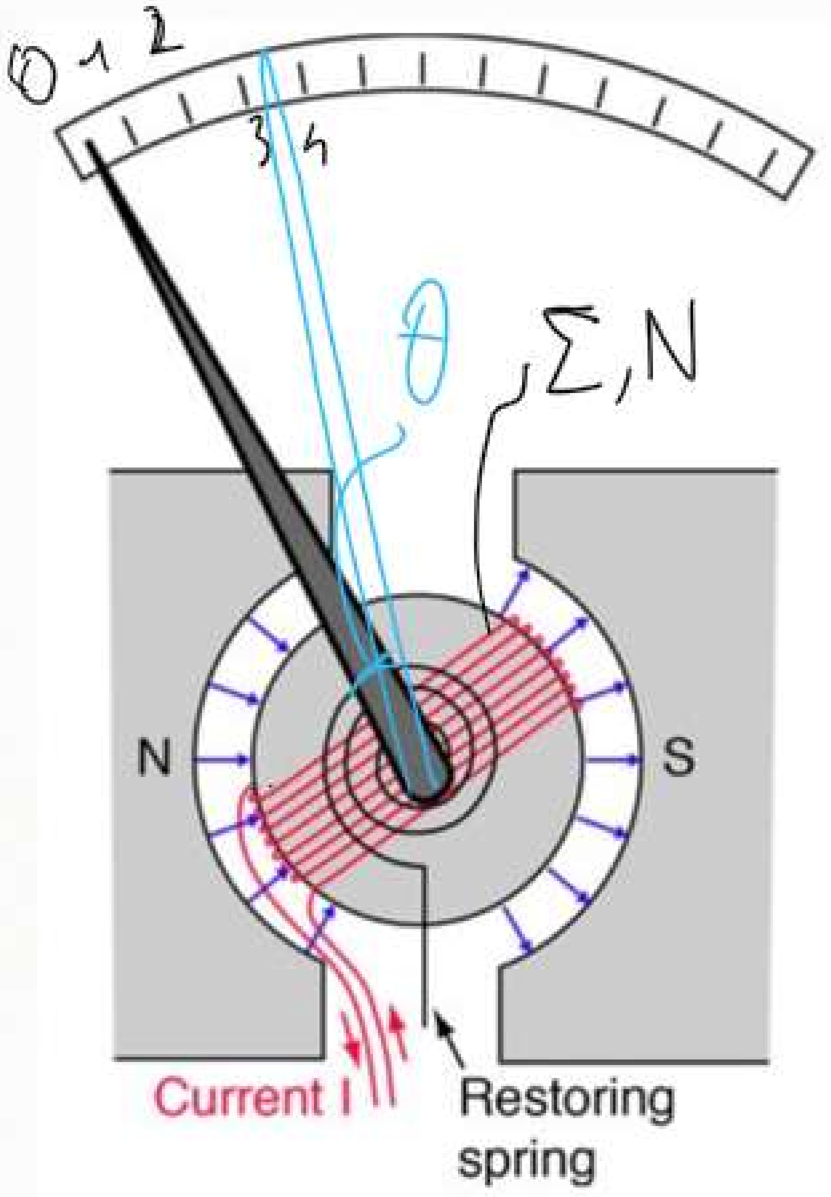
$$\vec{M} = \vec{p} \times \vec{E} \quad , \quad \vec{U}_e = - \vec{p} \cdot \vec{E}$$

$$\vec{M} = \frac{d\vec{L}}{dt} \Rightarrow \boxed{M = I\alpha = I \frac{d^2\theta}{dt^2}}$$



I = MOMENTO D'INERZIA

$$\boxed{[m] = Am^2 = \frac{J}{T}}$$



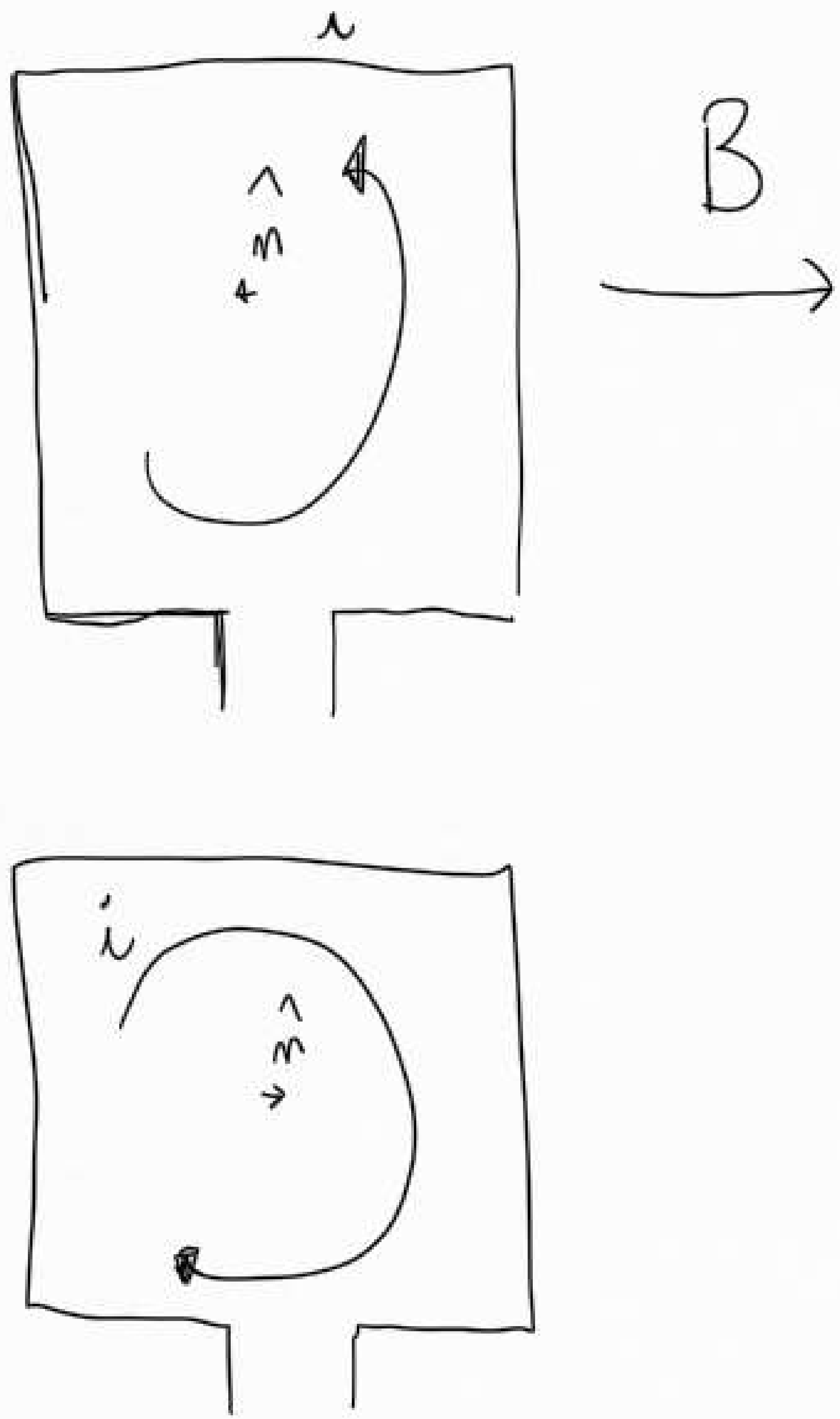
$F = \kappa \Delta x$

$M = \kappa \theta$

$M_s = i \Sigma B \mapsto M = N M_s = i \Sigma B N \mapsto$

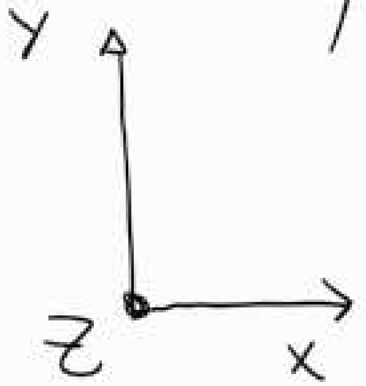
$\kappa \theta = i \Sigma B N \mapsto$

$$\theta = i \boxed{\frac{\Sigma B N}{\kappa}}$$



B
$\hat{n}$
i
$\hat{n}$

$\vec{v} \perp \vec{B}$, $\theta = \frac{\pi}{2}$, $F_L = vB\sin\theta = vB$



$\vec{B} \parallel \hat{z}$, $\vec{v} = (v_x, v_y, 0) \mapsto$

$$\vec{F}_L = q\left(v_x\hat{x} + v_y\hat{y}\right) \times \left(B\hat{z}\right) = -q v_x B\hat{y} + q v_y B\hat{x} =$$

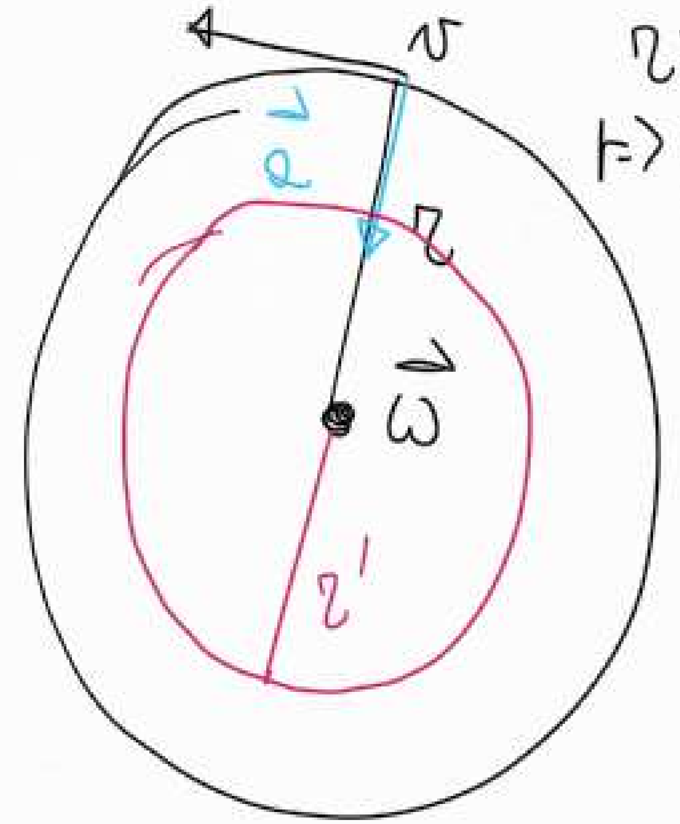
$$= \left(q v_y B, -q v_x B, 0\right)$$

$$\left.\begin{aligned} & F_L = qvB = ma = \text{costante del moto} \mapsto \\ & \vec{a} = \frac{\vec{F}_L}{m} \mapsto \vec{a} \parallel \vec{F}_L \perp \vec{v} \mapsto \vec{a} \perp v \end{aligned}\right\} \text{MOTO CIRCOLARE UNIFORME}$$

- $v_T = v = \frac{2\pi r}{T}$ | r RAGGIO DI CURVATURA
T periodo

- $\omega = \frac{2\pi}{T} = \frac{d\theta}{dt} = \frac{v}{r}$, $\vec{\omega}$

- $\vec{a} = \vec{\omega} \times \vec{v}$, $|\vec{a}| = a = \frac{v^2}{r} \Rightarrow$



$r > r'$

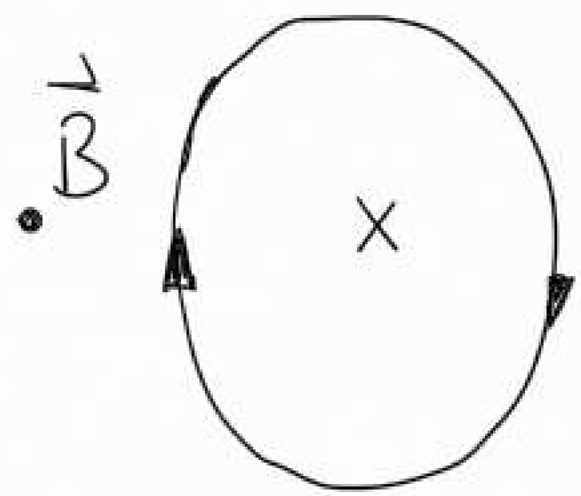
$\Rightarrow B' > B$

$$ma = qvB \Rightarrow \frac{mv^2}{r} = q\cancel{v}B \Rightarrow$$

$$\boxed{r = \frac{mv}{qB}} \Rightarrow \omega = \frac{v}{r} = \frac{qB}{m} \Rightarrow \boxed{B = \frac{m\omega}{q}}$$

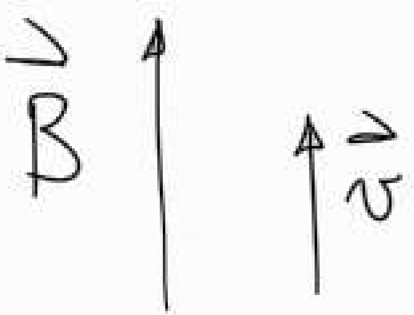
$$m\vec{a} = q\vec{v} \times \vec{B} = m\vec{\omega} \times \vec{v} = -m\vec{v} \times \vec{\omega} \Rightarrow \vec{v} \times (q\vec{B}) = \vec{v} \times (-m\vec{\omega})$$

$$\boxed{\vec{\omega} = -\frac{q}{m}\vec{B}}$$



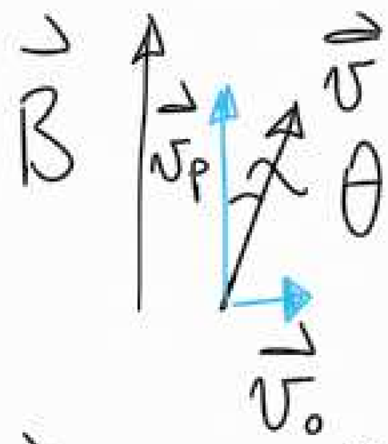
$\theta \neq \frac{\pi}{2}$

I $\theta = 0$



$$\vec{F}_L = q\vec{v}\times\vec{B} = 0$$

II $\theta \neq \frac{\pi}{2}, \ \theta \neq 0$



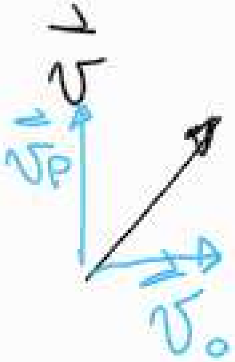
$v_p = v\cos\theta$, $v_o = v\sin\theta$

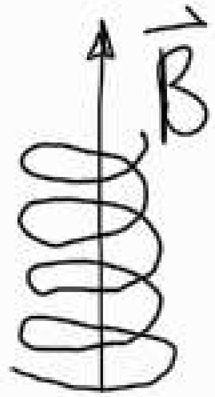
$\vec{v} = \vec{v}_p + \vec{v}_o$

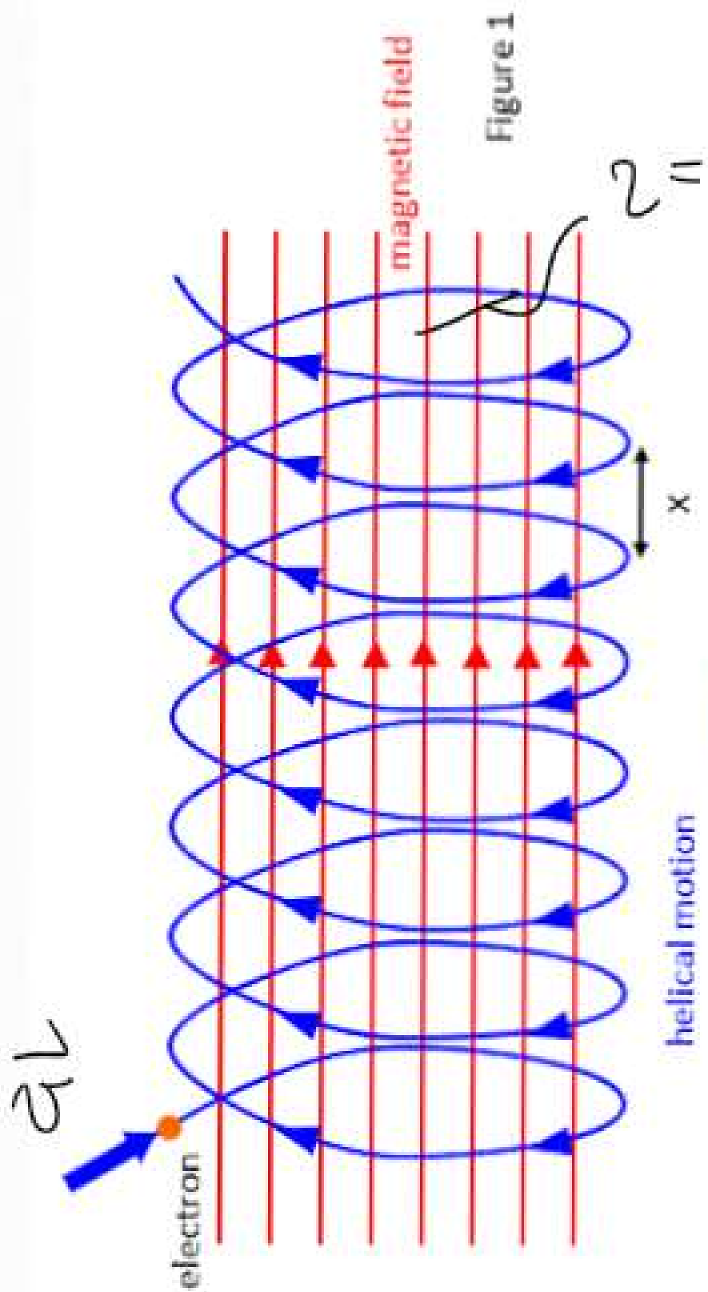
$$\vec{F}_L = q\vec{v}\times\vec{B} = q(\vec{v}_p + \vec{v}_o)\times\vec{B} = \cancel{q\vec{v}_p\times\vec{B}} + \vec{v}_o\times\vec{B} =$$

$$= q\vec{v}_o\times\vec{B},$$

$$r = \frac{m v_o}{qB} = \frac{m v \sin\theta}{qB}$$





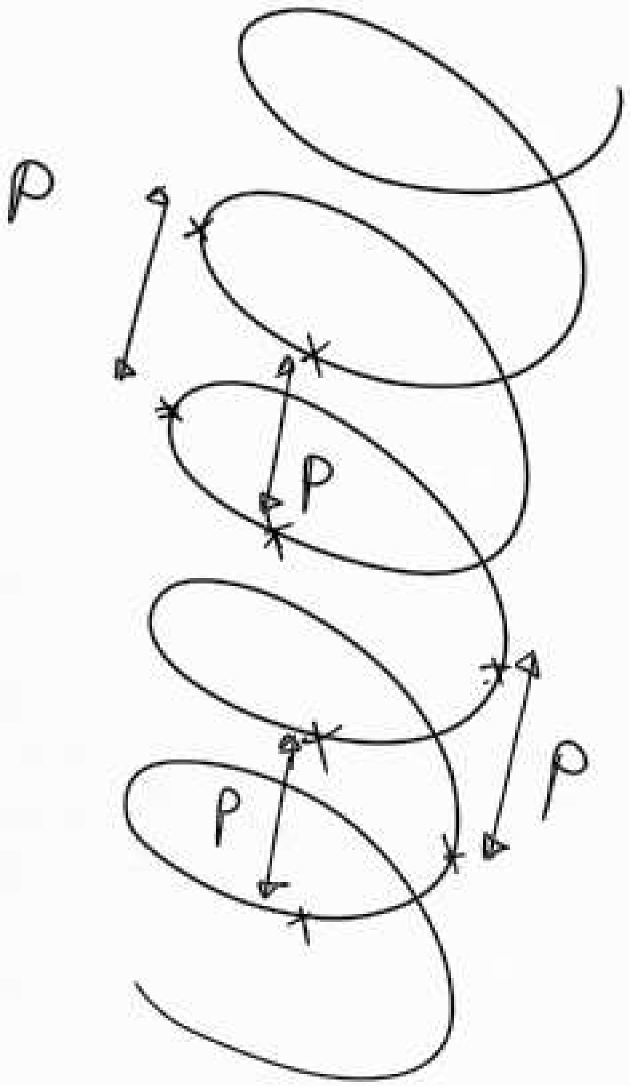


$$r = \frac{m v_0}{qB} = \frac{m v \sin\theta}{qB}$$

$$T = \frac{2\pi r}{v_0} = \frac{m}{qB} 2\pi$$

$$\boxed{p = v_p T = \frac{2\pi m}{qB} v \cos\theta}$$

PASSO DELL'ELICA


p
p
p
p