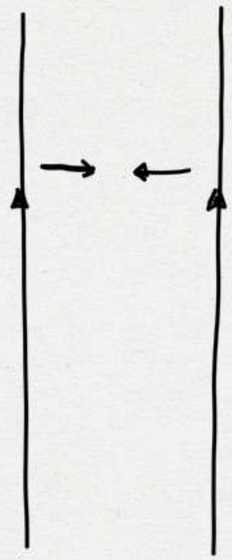
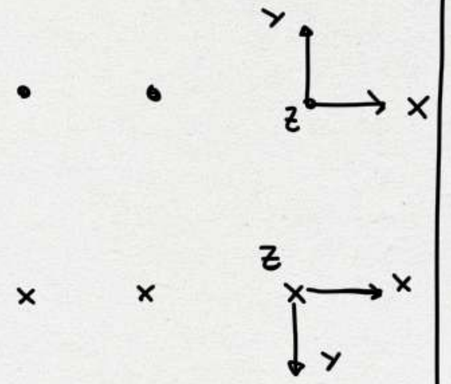
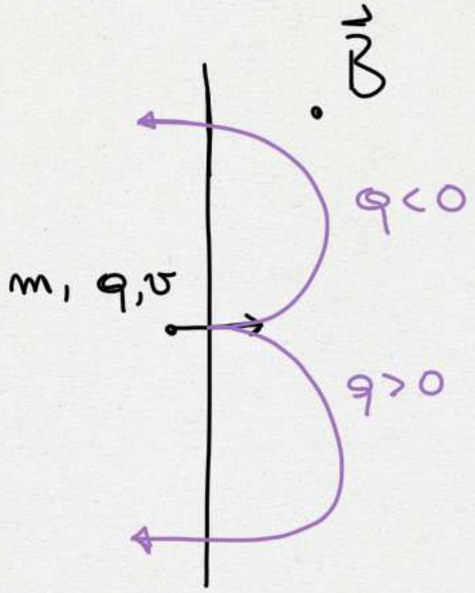
①

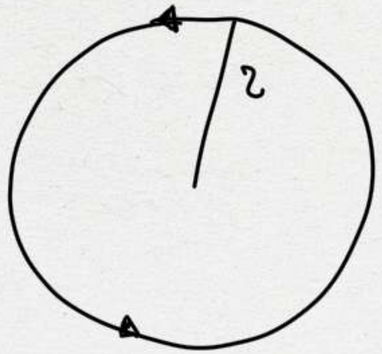





②




③




$$r = \frac{mv}{qB}$$

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

$$T = \frac{2\pi}{\omega} = \frac{2\pi m}{qB}$$

$$\omega = \frac{qB}{m} = \frac{v}{r}$$

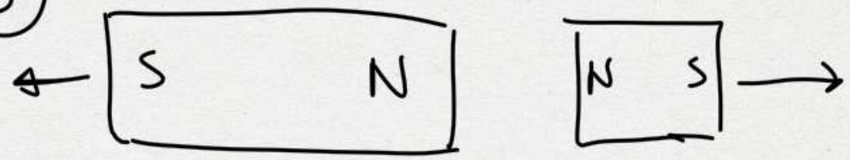
④

$$\vec{M} = \vec{m} \times \vec{B}, \quad \vec{m} = i \Sigma \hat{n}$$

$$\vec{F}_{TOT} = 0$$

$\vec{B}$ UNIFORME

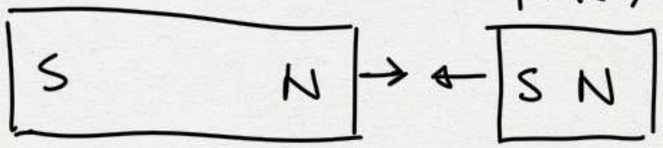
(5)



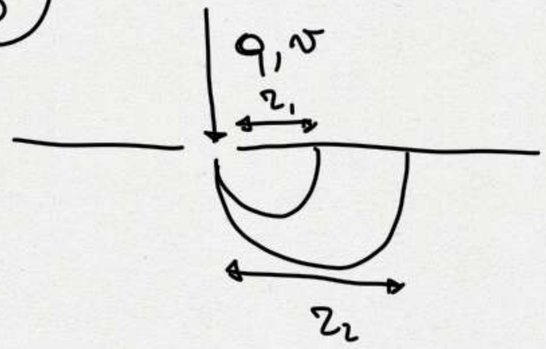

DIAMAGNETE




PARA/FERRO MAGNETE




(6)



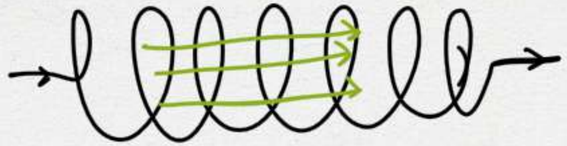

$z_1 = \frac{1}{2} z_2$

$\frac{m_1 \cancel{v}}{\cancel{q}B} = \frac{1}{2} \frac{m_2 \cancel{v}}{\cancel{q}B} \Rightarrow$

$m_1 = \frac{1}{2} m_2$

(7)

$B = \mu_0 n i$



(8)

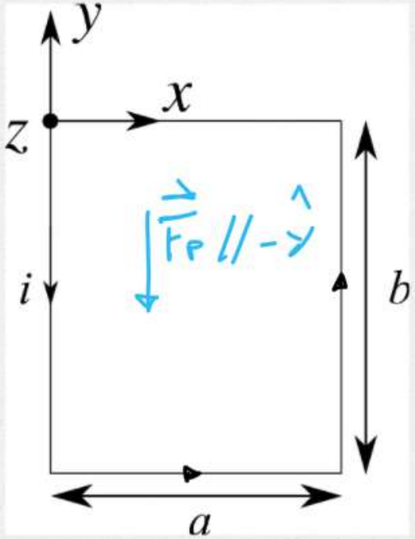
$B = K_m B_0$

$K_m < 1$ D.M.

$K_m > 1$ P.M.

$K_m \sim 10^3$ F.M.

# 6.27 MNV - 44 LR




$\lambda_m = 0.05\ g/cm$, $m = \lambda_m P = \lambda_m 2(a+b)$, $\theta_0 = 12° = 0.209\ rad$

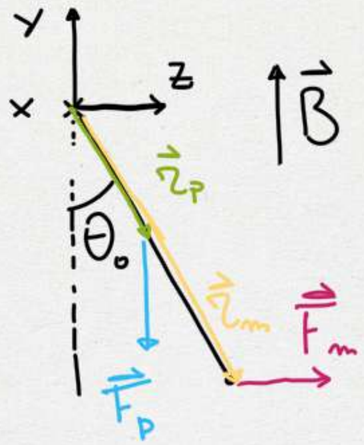
$i = 6A$

$\vec{B}$ è uniforme e $// \pm \hat{y}$

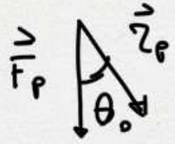
$\vec{M}_{TOT} = 0$

$\vec{F}_m = i\vec{\ell} \times \vec{B} = F_m \hat{z} = i a \hat{x} \times \vec{B} = \hat{z} \Rightarrow \vec{B} // \hat{y}$

$\vec{M}_{TOT} = \vec{M}_P + \vec{M}_m = 0 \Rightarrow \vec{M}_P = -\vec{M}_m \Rightarrow M_P = M_m$

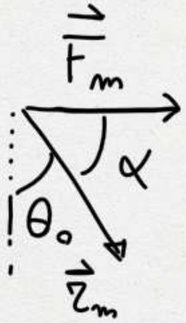



$M_P = mg\, r_P \sin\theta_0 =$



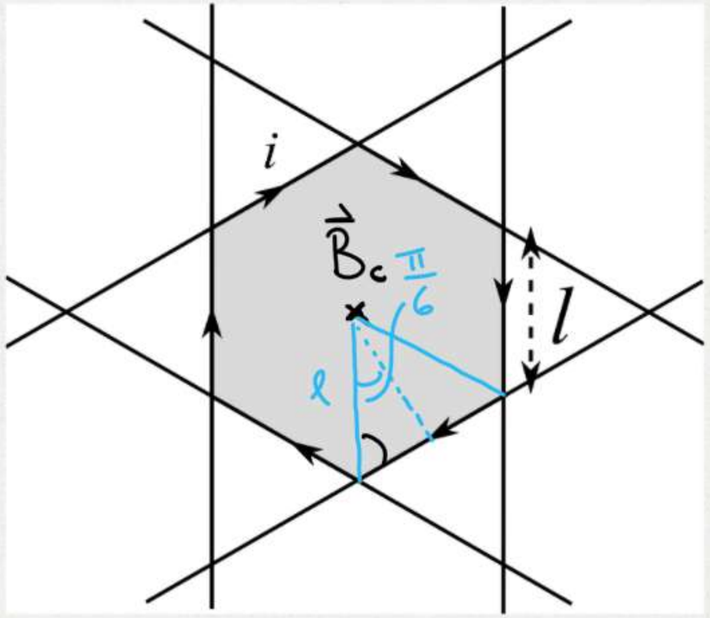

$= \dfrac{mgb\sin\theta_0}{2}$

$M_m = iaBb\sin\alpha = iaBb\sin\left(\frac{\pi}{2} - \theta_0\right) = iaBb\cos\theta_0$



$$B = \frac{mg}{2ai} \operatorname{tg}\theta_0 = 5.21 \cdot 10^{-3}\ T$$

② $W = ?$ per passare da $\theta = 0$ a $\theta = \theta_0$




$i = 6\,A$ , $l = 10\,cm$

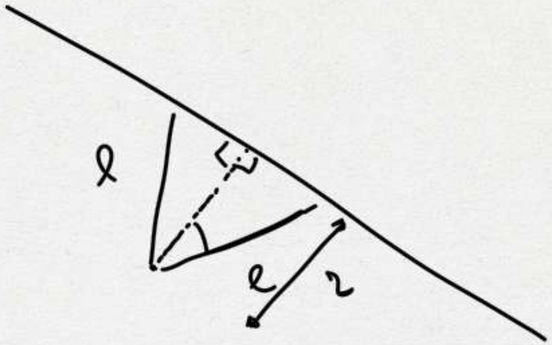
$\vec{B}_c = ?$

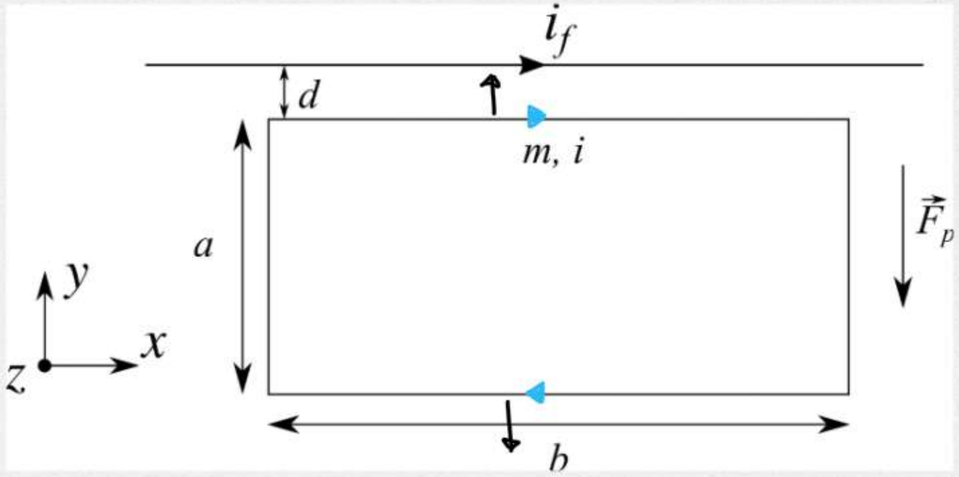
$\vec{B}_c = 6\,\vec{B}_f$

$B_f = \frac{\mu_0 i}{2\pi r}$

$r = l\cos\frac{\pi}{6} = l\sin\frac{\pi}{3}$

$B_c = 13.86\,\mu T$






$a = 40\ cm$, $b = 1\ m$, $m = 1\ g$

$d = 1\ cm$, $i_f = 30\ A$

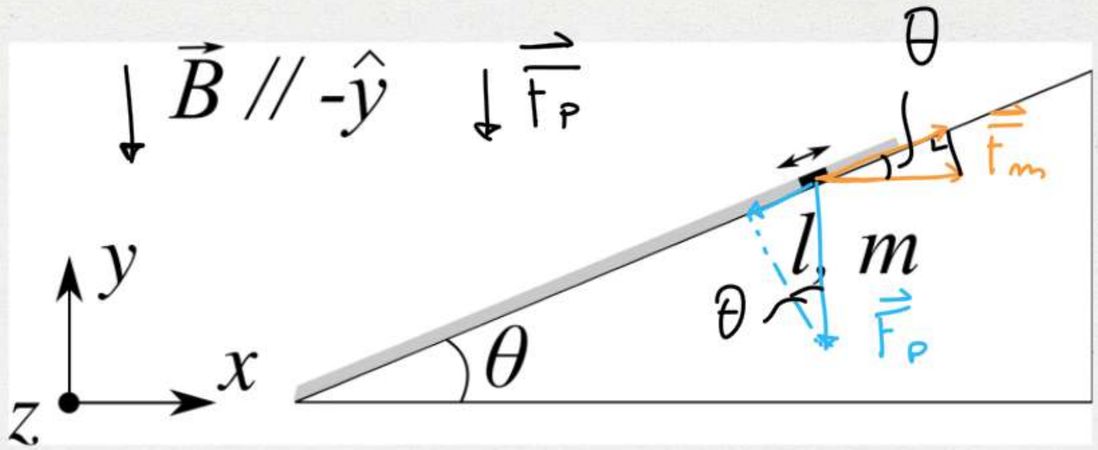
$i = ?$

$\vec{F}_{TOT} = 0$

$$B_f = \frac{\mu_0 i_f}{2\pi r}$$

$$F_m = i b \frac{\mu_0 i_f}{2\pi}\left(\frac{1}{d} - \frac{1}{d+a}\right) = F_p = mg \Rightarrow$$

$$\boxed{i = \frac{2\pi mg}{b\mu_0 i_f}\,\frac{d(d+a)}{a} = 16.8\ A}$$




$\theta = \frac{\pi}{6} = 30°$, $l = 50\ cm$

$m = 0.1\ kg$

$\vec{B} = -B_0 \hat{y}$, $B_0 = 0.8\ T$

$i = ?$

$mg \sin\theta = iBl\cos\theta \Rightarrow$

$i = \frac{mg}{Bl} tg\theta = 1.4\ A$