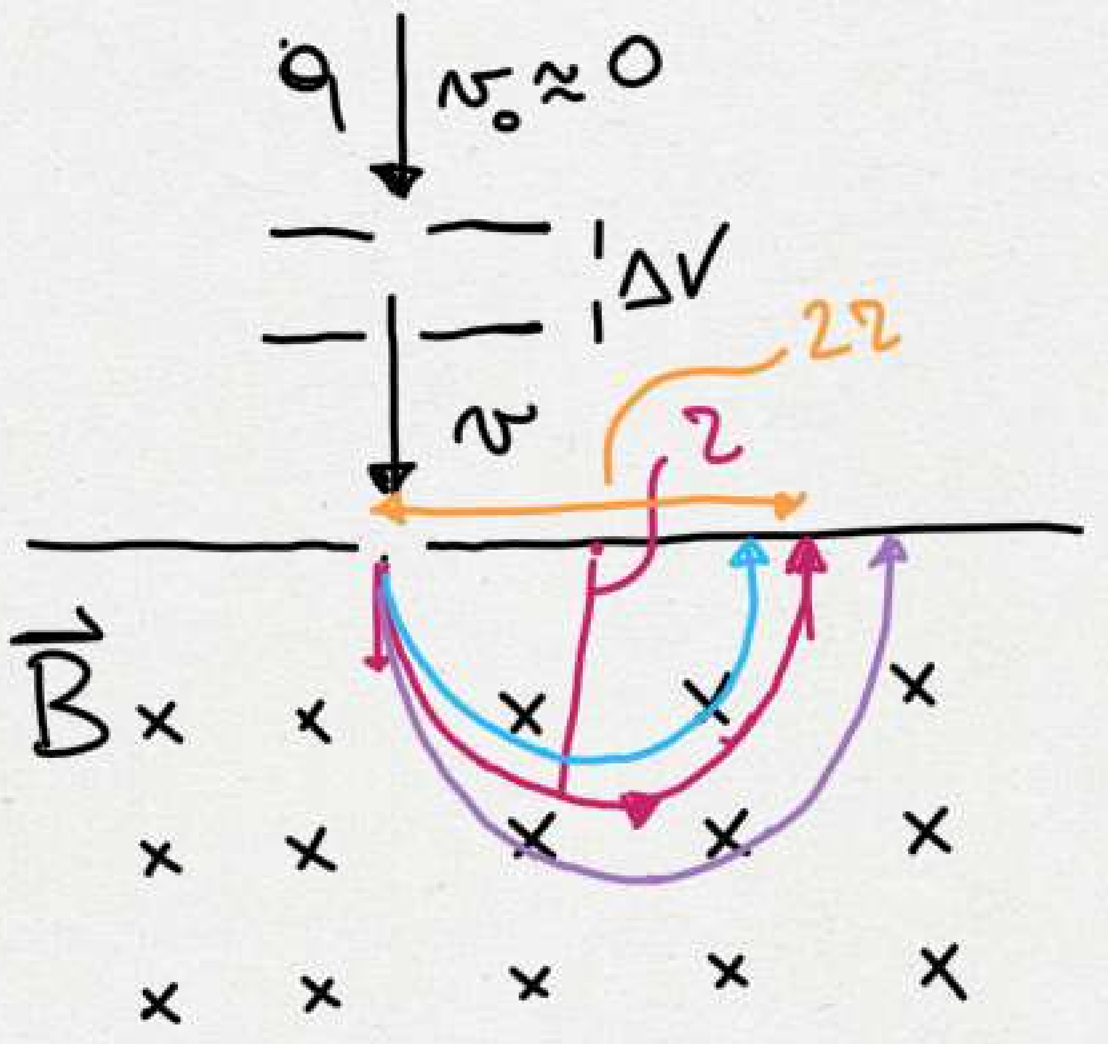
SPETTROMETRI DI MASSA

$\frac{q}{m}$ DIFFERENTI

S. DI DEMPSTER

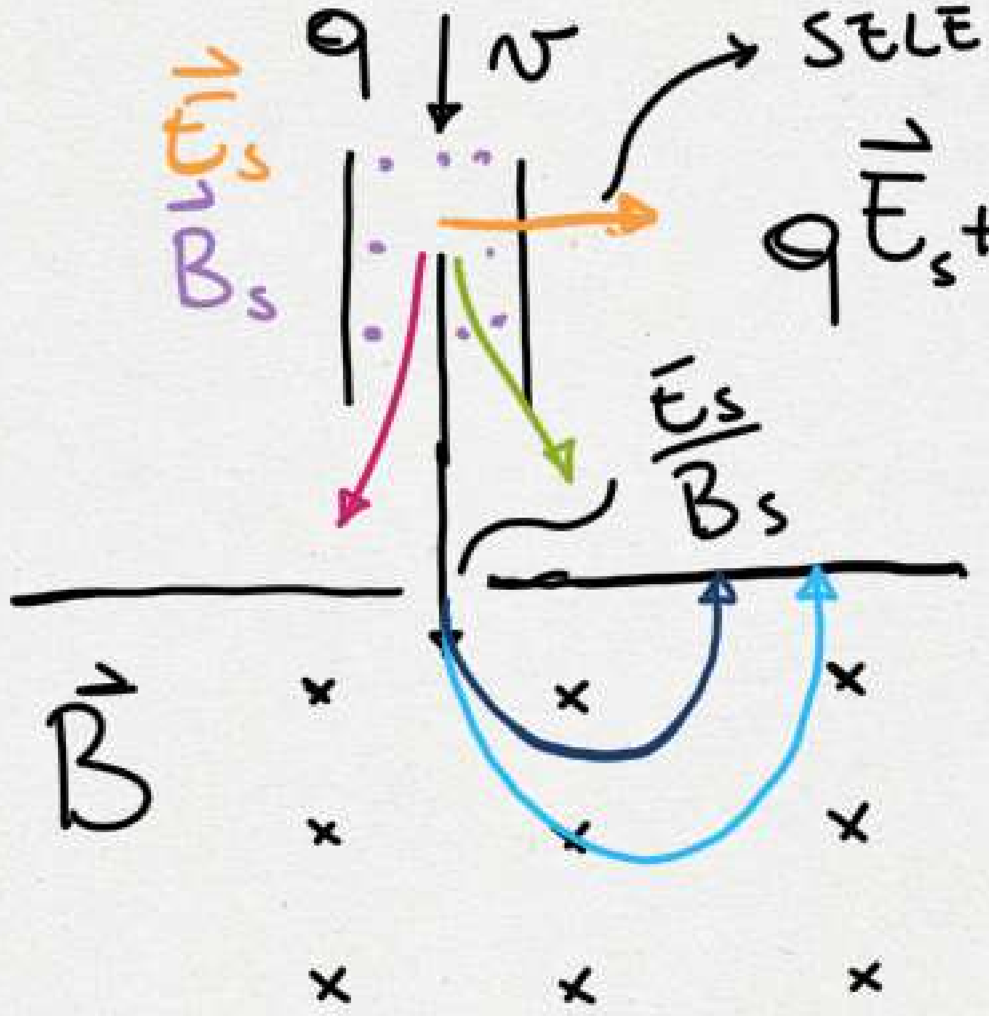


$$U_k = q\Delta V = \frac{1}{2} m v^2 \Rightarrow v = \sqrt{\frac{2q\Delta V}{m}}$$

$$r = \frac{mv}{qB} = \frac{m}{qB}\sqrt{\frac{2q\Delta V}{m}} = \sqrt{\frac{2m\Delta V}{qB^2}} \Rightarrow$$

$$\frac{r^2 B^2}{2\Delta V} = \frac{m}{q}$$

S. DI BAINBRIDGE

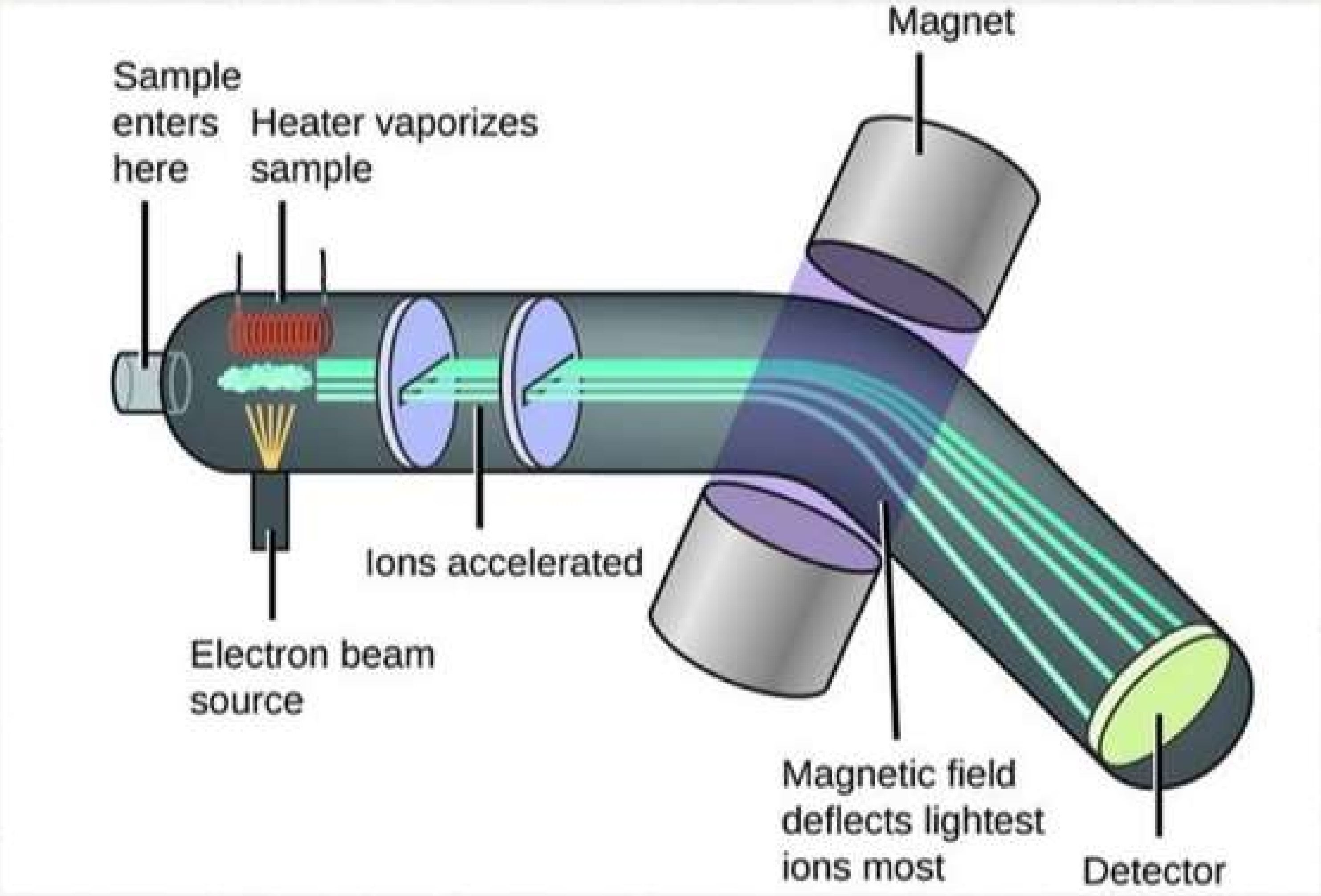


SELETTORE DI VELOCITÀ

$$q\vec{E}_s + q\vec{v} \times \vec{B}_s = \vec{F}_{TOT} = 0 \quad , \quad qE_s - qvB_s = F_{TOT} = 0 \Rightarrow E_s = vB_s \Rightarrow$$

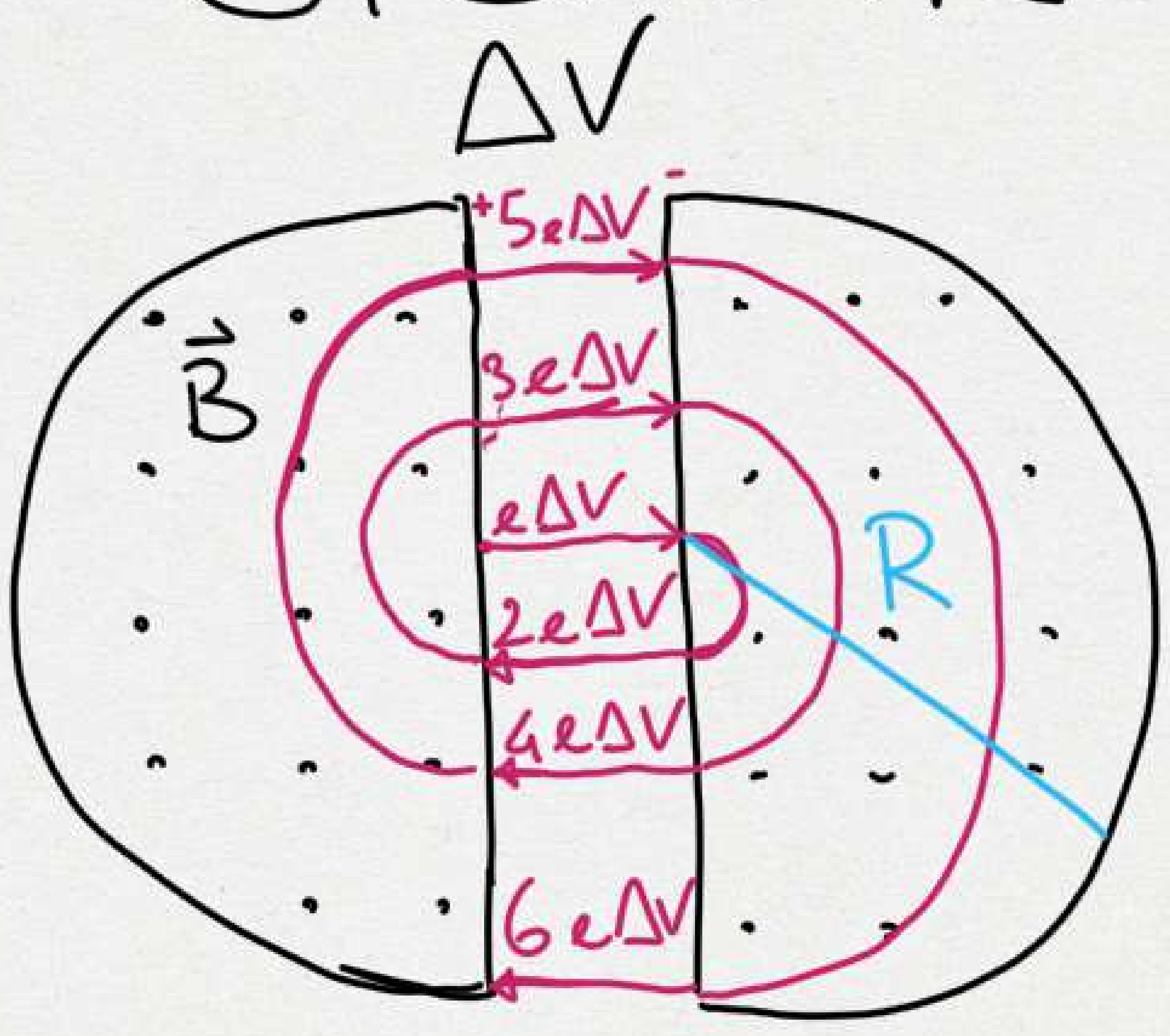
$$v = \frac{E_s}{B_s}$$

$$r = \frac{mv}{qB} = \frac{mE_s}{qBB_s} \Rightarrow \boxed{\frac{m}{q} = \frac{BB_s r}{mE_s}}$$



CICLOTRONE

TERAPIA ADRONICA



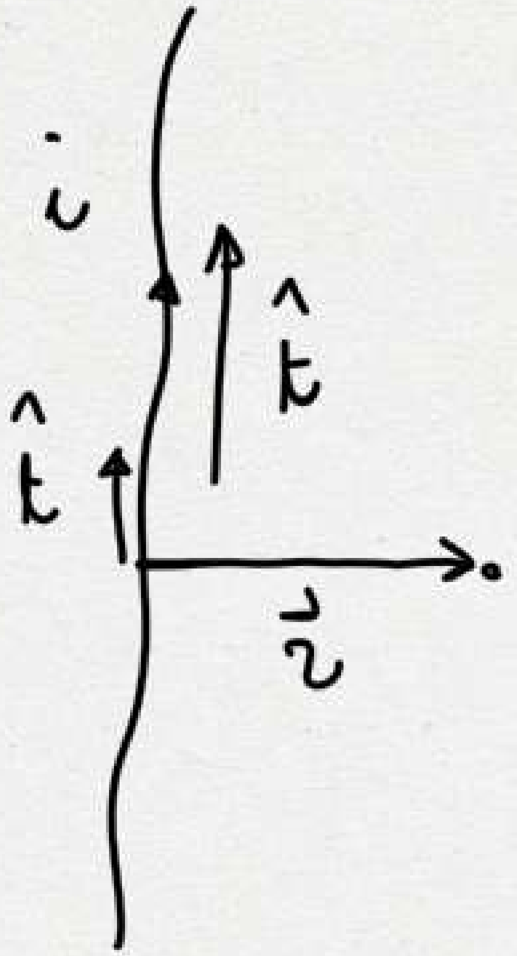
$$\Delta V(t) = V_0 \sin(\omega_{RF} t) \longleftarrow$$

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

$$\omega_{RF} = \omega, \quad \omega = \frac{qB}{m} = \frac{eB}{m}$$

$$R = \frac{m v_{max}}{qB} \Rightarrow v_{max} = \frac{RqB}{m}$$

DARIO BRESSANINI



① $B(r) \sim \frac{1}{r^2}$

② $B(r) \sim i$

③ $\vec B \perp \vec r$, $\vec B \perp \hat t$

$$d\vec B(\vec r) = K_m\, i\, \frac{d\vec l \times \hat r}{r^2}$$

dl è la lunghezza del filo

la dir. e verso di dl sono quelli della corrente

$$\begin{cases} d\vec l = \hat t\, dl \\ K_m = 10^{-7}\,\frac{Tm}{A} = \frac{\mu_0}{4\pi} \end{cases}$$

, $\mu_0 = 4\pi K_m = 4\pi \cdot 10^{-7}\,\frac{Tm}{A} \simeq 1.26 \cdot 10^{-6}\,\frac{Tm}{A}$

μ_0: PERMEABILITÀ MAGNETICA DEL VUOTO

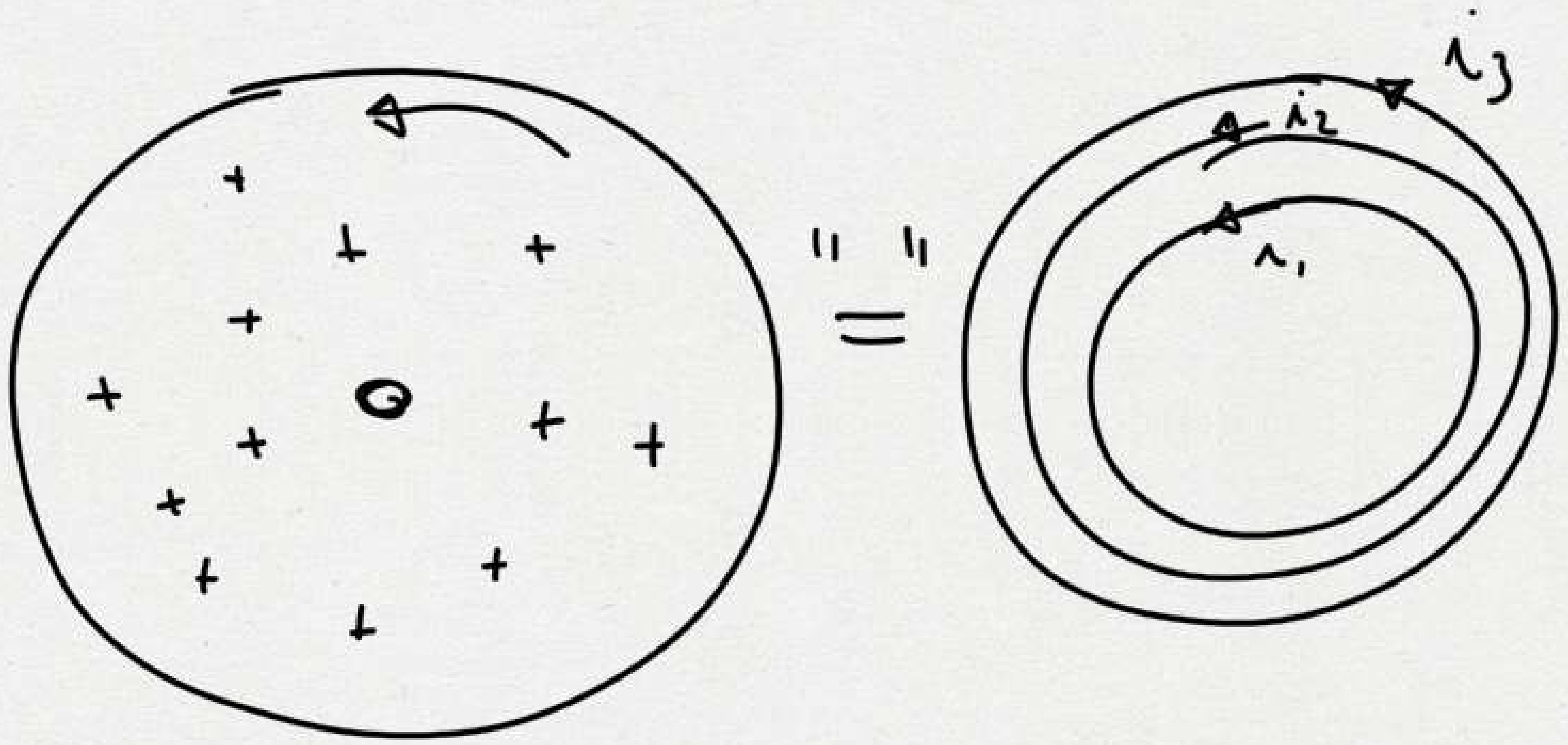
$$d\vec B(\vec r) = \frac{\mu_0}{4\pi}\,\frac{i\, dl}{r^2}\,\hat t \times \hat r$$

I LEGGE ELEMENTARE DI LAPLACE

$$\vec B = \frac{\mu_0 i}{4\pi} \oint_{\text{CIRCUITO}} \frac{d\vec l \times \hat r}{r^2}$$

$$\vec{B} = \frac{\mu_0}{4\pi}\,\frac{q\vec{v}\times\hat{r}}{r^2}$$ campo generato da una carica q che si muove con $\vec{v}$

$$J = \frac{i}{\Sigma}\,, \quad \vec{J} = nq\vec{v}$$

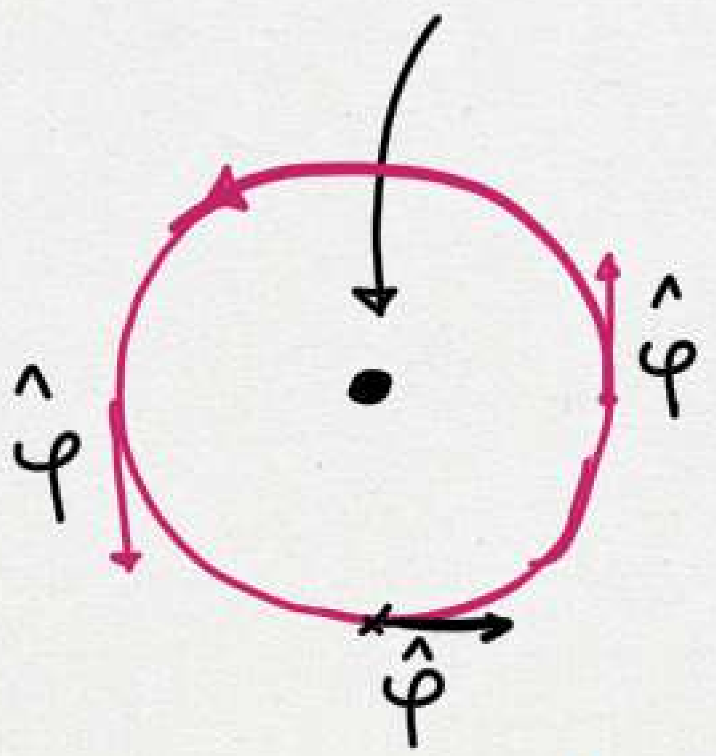


LEGGE DI AMPERE

TEOREMA DI GAUSS PER $\vec{E}$: $E \leftrightarrow q$

TEOREMA DI AMPERE : $B \leftrightarrow i$

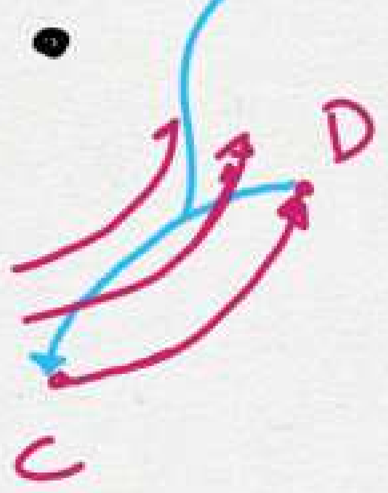
FILO



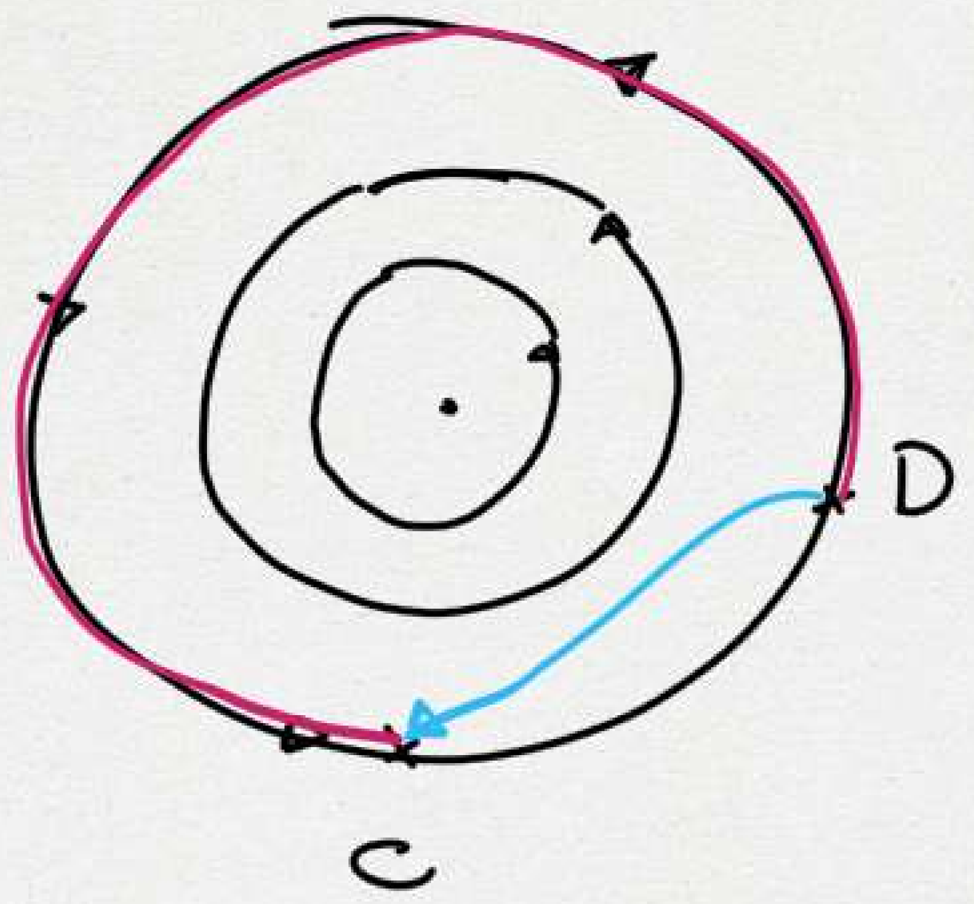
$$\vec{B}(r) = \frac{\mu_0 i}{2\pi r}\hat{\varphi}$$

$$\oint \underbrace{\vec{B}\cdot d\vec{s}}_{\text{LINEA DI CAMPO}} > 0$$

$\vec{B}\cdot d\vec{s} < 0$

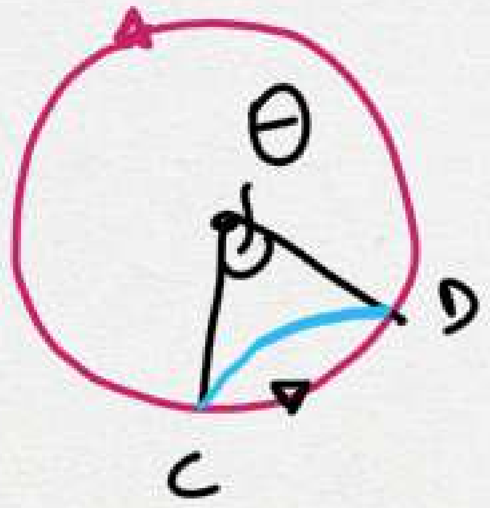


$$\oint \vec{B}\cdot d\vec{s} = \overbrace{\int_C^D \vec{B}\cdot d\vec{s}}^{>0} + \int_D^C \vec{B}\cdot d\vec{s} = 0$$

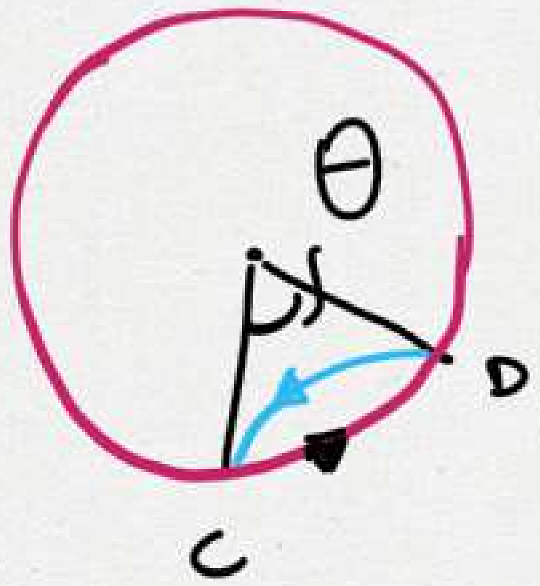


$$\vec{B}(\vec{r}) = \frac{\mu_0 i}{2\pi r}\hat{\varphi}$$

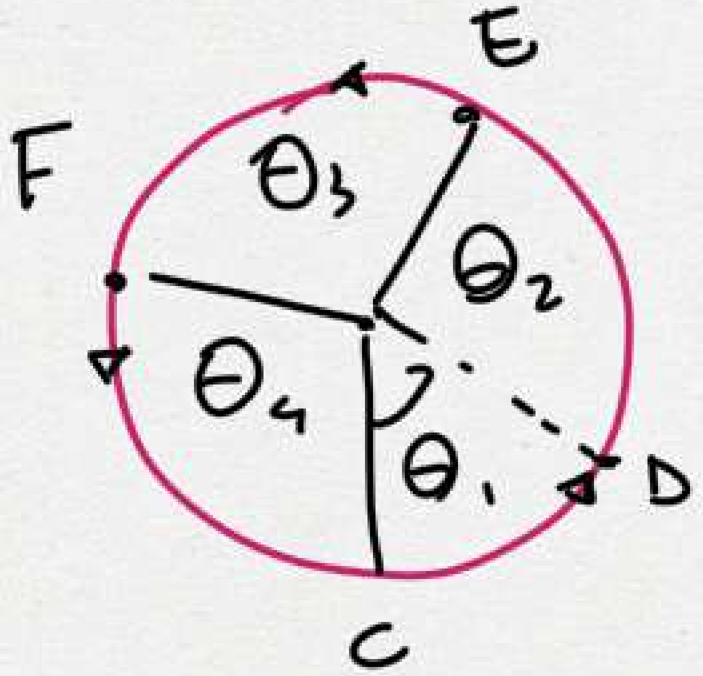
$$\int_C^D \vec{B}\cdot d\vec{s} = \int_C^D \frac{\mu_0 i}{2\pi r}\, ds = \int_C^D \frac{\mu_0 i}{2\pi \cancel{r}}\, \cancel{r}\, d\theta = \int_C^D \frac{\mu_0 i}{2\pi}\, d\theta = \frac{\mu_0 i}{2\pi}\theta$$



$$\int_C^D \vec{B}\cdot d\vec{s} = \int_C^D \vec{B}\cdot(d\vec{s}_p + d\vec{s}_0) = \int_C^D \vec{B}\cdot d\vec{s}_p = \int_C^D \frac{\mu_0 i}{2\pi \cancel{r}}\, \cancel{r}\, d\theta = \frac{\mu_0 i}{2\pi}\theta$$



$$\oint \vec{B}\cdot d\vec{s} = \int_C^D \vec{B}\cdot d\vec{s} + \int_D^C \vec{B}\cdot d\vec{s} = \frac{\mu_0 i}{2\pi}\theta + \left(-\frac{\mu_0 i}{2\pi}\theta\right) = 0$$

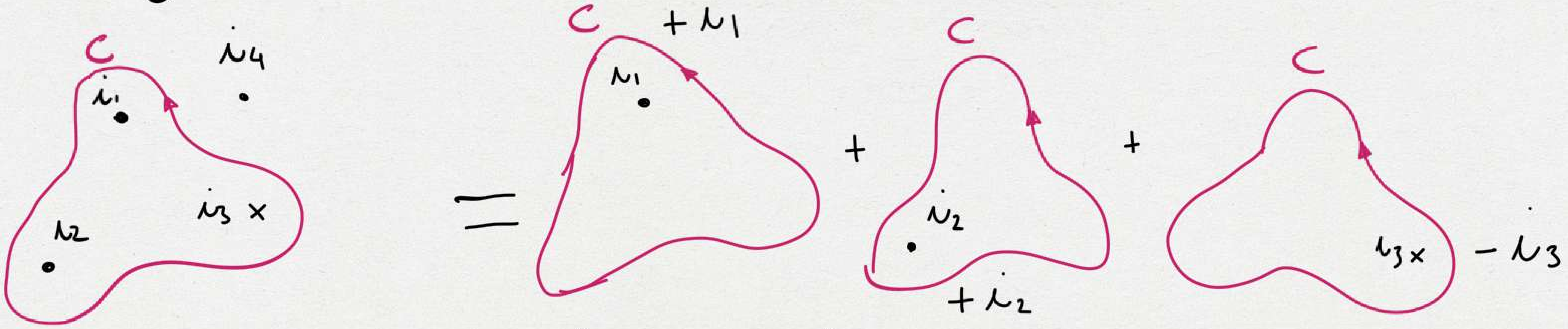


$$\oint \vec{B}\cdot d\vec{s} = \int_C^D \vec{B}\cdot d\vec{s} + \int_D^E \dots + \int_E^F \dots + \int_F^C = \frac{\mu_0 i}{2\pi}(\theta_1 + \theta_2 + \theta_3 + \theta_4) = \mu_0 i$$

$$\oint_C \vec{B} \cdot d\vec{s} = \mu_0 \sum_k i_k$$

TEOREMA DI AMPERE

le i_k sono tutte le correnti concatenate al cammino C



le i_k vanno prese col verso giusto

$$\oint_C \vec{B} \cdot d\vec{s} = \mu_0 (i_1 + i_2 - i_3)$$