Magnetismo

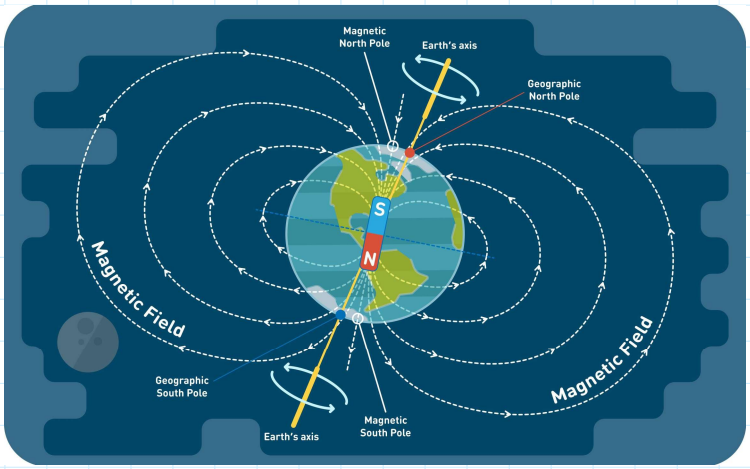
Friday, July 11, 2025 6:32 PM

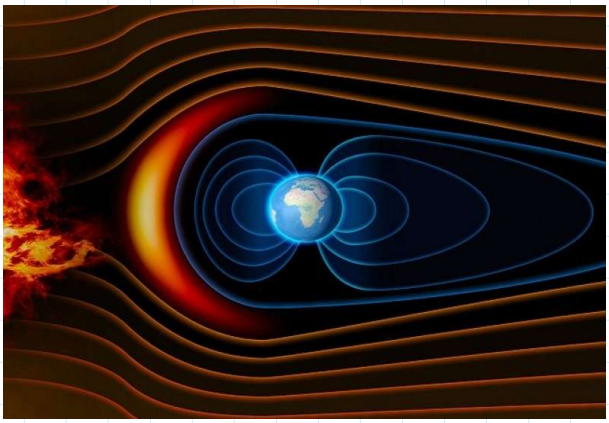
Fuerza Fundamental → Cargas en movimiento

↳ Corriente $I = \frac{dQ}{dt}$

Campo Magnético: B (T) Teslas

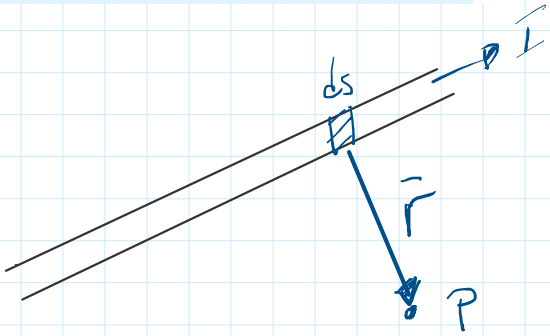
Podemos ver el campo magnético como consecuencia de la corriente.

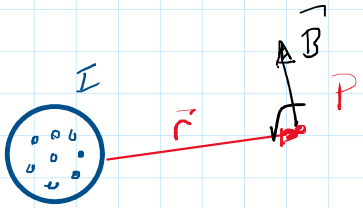


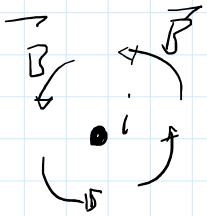


Ley de Biot-Savart

$$d\vec{\mathbf{B}} = \frac{\mu_0}{4\pi}\frac{I\,d\vec{\mathbf{s}} \times \hat{\mathbf{r}}}{r^2} \Rightarrow \vec{B} = \frac{\mu_0}{4\pi}\int \frac{I \cdot d\vec{s} \times \vec{r}}{r^2}$$







Ley de Ampere

Ley de Gauss

Ley de Ampere

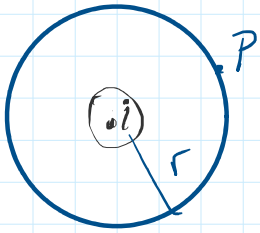
$$\oint \vec{B} \cdot d\vec{s} = i_{enc} \cdot \mu_0$$

↓ una curva

Ley de Gauss

$$\oint \vec{E} \cdot d\vec{A} = \frac{Q_{enc}}{\epsilon_0}$$

Cable largo:

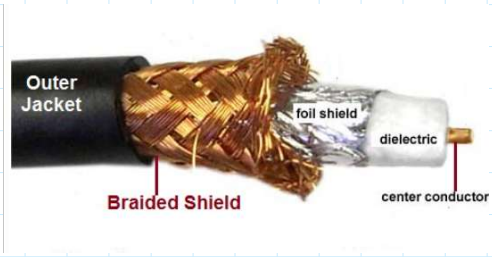


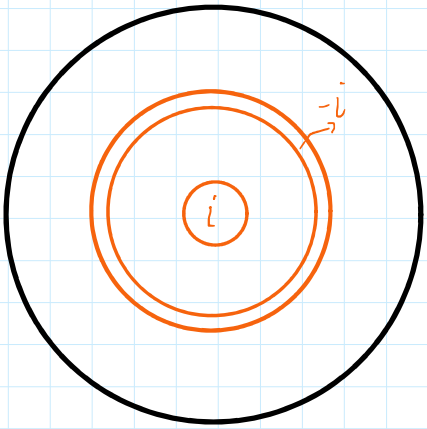
$$\oint \vec{B} \cdot d\vec{s} = i_{enc}\,\mu_0$$

$$\vec{B} \cdot 2\pi r = i\,\mu_0$$

$$\vec{B} = \frac{i\,\mu_0}{2\pi r}$$

Cable Coaxial



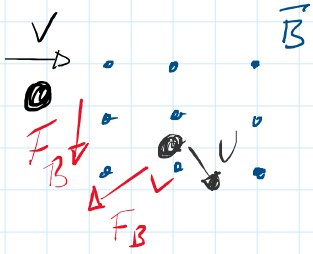


$$i_{enc} = i + (-i) = 0$$

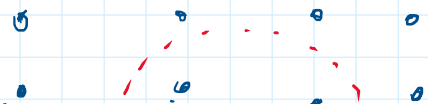
$$\Rightarrow \vec{B} = 0$$

¿Como afecta el magnetismo?

$$\vec{F}_B = q\vec{V} \times \vec{B}$$



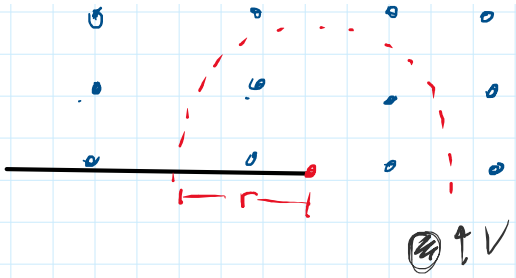
Espectrómetro de Masas



$$F_c = ma_c$$

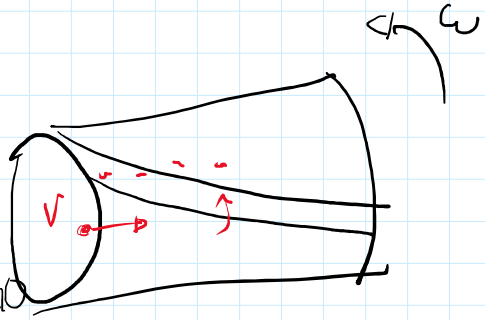
$$qVB = \frac{mV^2}{r}$$

Me permite identificar moléculas

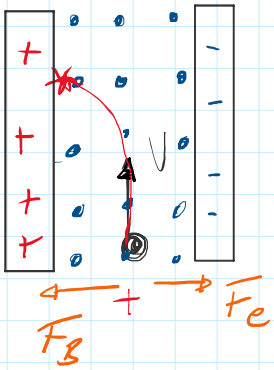


$\frac{Bqr}{V} = \frac{m}{q}$

moléculas



Selector de Velocidad:



$\sum F_x : -F_B + F_e = ma$

$-qVB + qE = ma$

$-qVB + qE = 0$

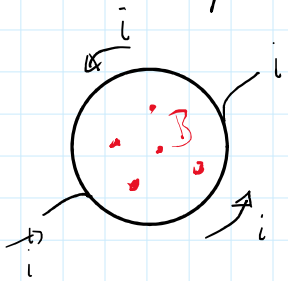
$qE = qVB$

$\frac{E}{B} = V$

Fuerzas en Conductores:

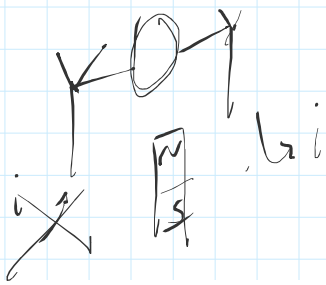
$$F = \int i \cdot d\vec{l} \times \vec{B}$$

Fuerza en una espira (Conductor cerrado)



Se genera un torque:

$\vec{\tau} = NiA \times \vec{B}$



Ideas de Proyecto:

- Espectrómetro + Selector.
- Motor casero
- Simular guitarr eléctrica.
- Distorsión para guitarra.
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