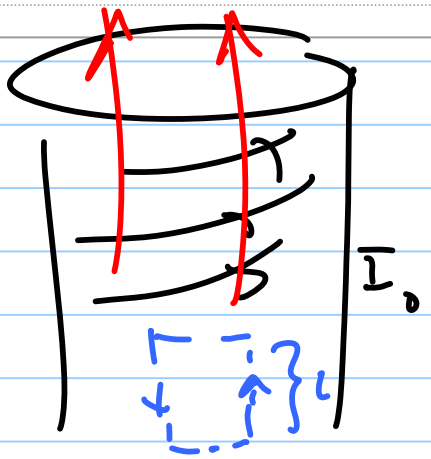
Note Title 4/7/2008



$$\oint \vec{B} \cdot d\vec{l} = \mu_0 I_{enc}$$

$B = 0$

$I_{enc} = 0$

$I_{enc} = 0$

$$\oint \vec{B} \cdot d\vec{l} = BL - BL = 0 = \mu_0 I_{enc}^{0}$$

Fund. prin.

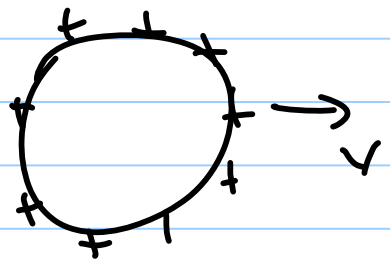
$$\vec{F} = q\vec{v} \times \vec{B} \rightarrow \int d\vec{F} = \int \vec{v} \times \vec{B}\, dq = \int \vec{J} \times \vec{B}\, d\tau$$

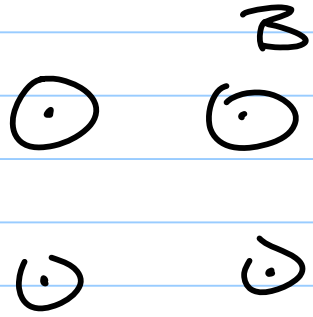
($dq = \rho\, d\tau$, $\vec{J} = \rho \vec{v}$)

Cons. energy

Faraday's Law $\quad \mathcal{E}mf = -\frac{d\Phi_m}{dt}$

no rotation



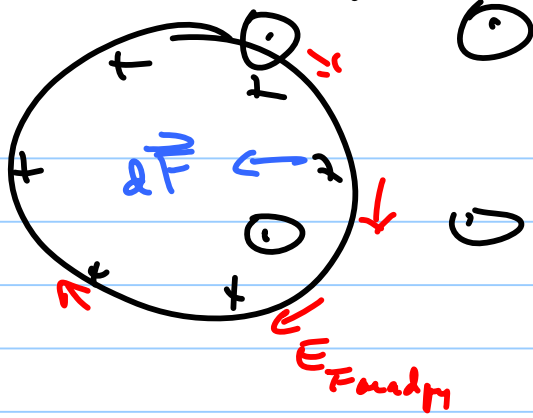


Lenz's law

$E_{Faraday}$ opposes change in flux

increasing mag flux induces an

$\mathcal{E}_{mf} = \oint \vec{E} \cdot d\vec{l}$ (Faraday)

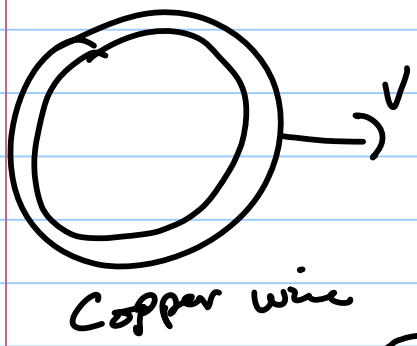


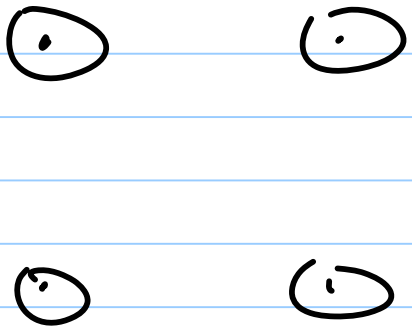
$d\vec{F} = I d\vec{l} \times \vec{B}$

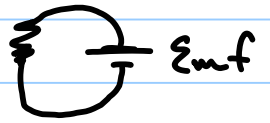
Linear motion: slows down loses KE

rotational motion: not rotating until enters B then rotating

Energy cons: translation KE → rotation KE (counter)







B

$\mathcal{E}_{mf} - IR = 0$ $\quad I = \frac{\mathcal{E}_{mf}}{R}$

$P_{rem} = I^2 R$