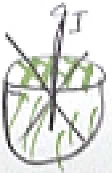
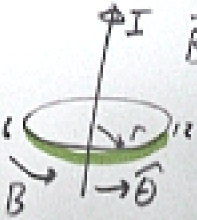
(220)

$$\sum_{\Delta s_i} \vec{B}_i \cdot \Delta \vec{s}_i = \mu_0 I_c$$





$$\vec{B} = |\vec{B}|\hat{\theta}$$

on s:

$|\vec{B}|$ constant , $\vec{B} \parallel \vec{s}$

$$\sum \vec{B}_i \cdot \Delta \vec{s}_i = \sum B_i \Delta s_i = B\left(\sum \Delta s_i\right)$$

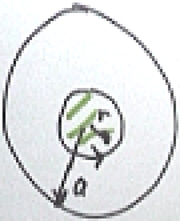
$\mu_0 = 4\pi \times 10^{-7}$

$$= B(2\pi r) \quad \Big\| \quad I_c = I$$

$$\vec{B} = \frac{\mu_0 I}{2\pi r}\hat{\theta}$$

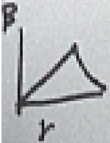
I

$$\vec{J} = \frac{I}{\pi a^2}\hat{z} \qquad \frac{A}{m^2}$$



$$I_c = \frac{I}{\pi a^2}\pi r^2 = I\left(\frac{r^2}{a^2}\right)$$

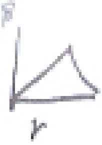
$$\sum \vec{B}_i \cdot \Delta\vec{S}_i = \mu_0 I_c$$



$$|\vec{B}| \cdot \text{const}, \ \vec{B} \parallel \vec{S}$$

$$\sum \vec{B}_i \cdot \Delta\hat{S}_i = B\,(2\pi r)$$

$$B = \frac{\mu_0 I \left(\frac{r^2}{a^2}\right)}{2\pi r} \Rightarrow \frac{\mu_0 I r}{2\pi a^2}\hat{\theta} = \vec{B}$$



$\sum \vec{B}_i \cdot \Delta \vec{S}_i = \mu_0 I_c$

$|\vec{B}|$ const, $\vec{B} \parallel \vec{S}$

$\sum \vec{B}_i \cdot \Delta \hat{S}_i = B(2\pi r)$

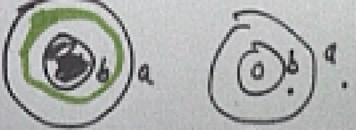
$B = \frac{\mu_0 I \left(\frac{r^2}{a^2}\right)}{2\pi r} \Rightarrow \frac{\mu_0 I r}{2\pi a^2} \hat{\theta} = \vec{B}$

DC : uniform J

AC :

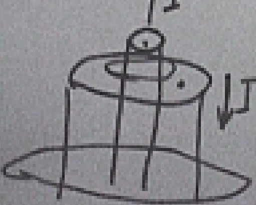
$R = \rho \frac{L}{A}$

$R \uparrow$ as freq $\uparrow$



$J = \frac{I}{\pi(a^2 - b^2)}$

$\uparrow I$



$\downarrow J$ $B = 0$

$$\sum \vec{B}_i \cdot \Delta \vec{S}_i = \mu_0 I_c$$

$$|\vec{B}| \text{ const}, \quad \vec{B} \parallel \vec{S}$$

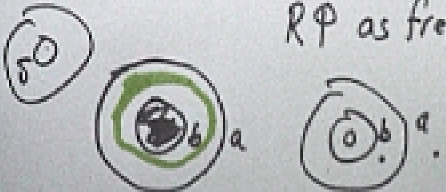
$$\sum \vec{B}_i \cdot \Delta \vec{S}_i = B(2\pi r)$$

$$B = \frac{\mu_0 I \left(\frac{r^2}{a^2}\right)}{2\pi r} \Rightarrow \frac{\mu_0 I r}{2\pi a^2}\hat{\theta} = \vec{B}$$

DC : uniform J

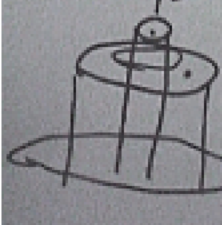
AC :  $R = \rho \frac{L}{A}$

R↑ as freq↑

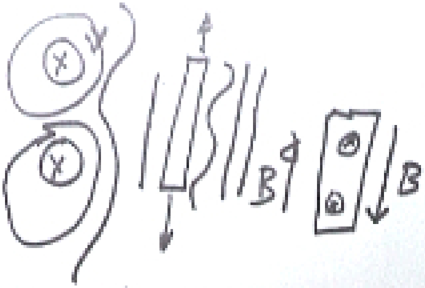


$$J = \frac{I}{\pi(a^2 - b^2)}$$

↑I



↓I $B = 0$



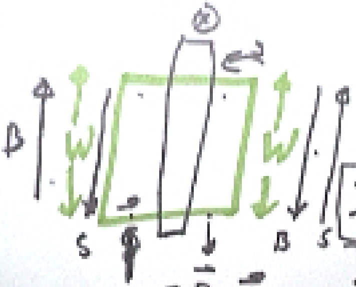
$$I_c = J_s\,(w)$$

$$\boxed{\frac{I}{2} = J_s w}$$

$$\sum \bar{B}_i \cdot \Delta \vec{S}_i = -2B\,w$$

$$J_s = \frac{\text{Current}}{\text{Length}} = \frac{I}{\text{Length}}$$

dB

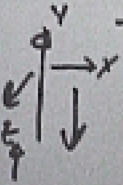


$I_c = J_s (w)$

$\boxed{I_c = J_s w}$

$$\sum_i \vec{B}_i \cdot \Delta \vec{S}_i = -2Bw$$

$$J_s = \frac{\text{Current}}{\text{Length}} = \frac{I}{\text{Length}}$$



$$-2Bw = \mu_0 J_s w$$

$$\vec{B} = -\frac{\mu_0 J_s}{2}\hat{y} \quad (x>0)$$

$$\vec{B} = \frac{\mu_0 J_s}{2}\hat{y} \quad (x<0)$$

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

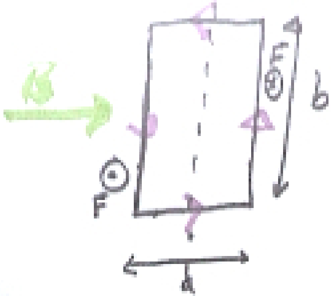
$$\vec{F} = I\vec{L} \times \vec{B}$$

$$F = ILB$$

$$\vec{\tau} = \hat{R} \times \vec{F}$$

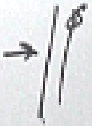
$$\tau = I\underset{\substack{\uparrow \\ b}}{L}B\left(\frac{a}{2}\right) + Ib\left(\frac{a}{2}\right)$$

$$= I(ab)\,B$$



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

$$\vec{F} = I\vec{L} \times \vec{B}$$



$$F = ILB$$

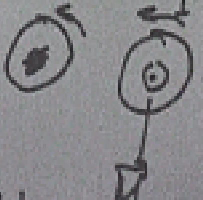
$$\vec{\tau} = \hat{R} \times \vec{F}$$

$$\tau = ILB\left(\frac{a}{2}\right) + Ib\left(\frac{a}{2}\right)$$

$$\underset{b}{\uparrow} \qquad = I\underset{\text{Area}}{(ab)}\,B$$

$$\tau = \underline{I\,(\text{Area})}\,B$$

$$\vec{\mu} = I\,\overrightarrow{\text{Area}}$$



$$\mu_0 = 4\pi \times 10^{-7}$$

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

$$\vec{F} = I\vec{L}\times\vec{B}$$

$$F = ILB$$

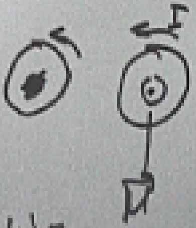
$$\vec{\tau} = \vec{R}\times\vec{F}$$

$$\tau = I\underset{\uparrow\, b}{L}B\left(\frac{a}{2}\right) + Ib\left(\frac{a}{2}\right)$$

$$= I\underbrace{(ab)}_{Area}B$$

$$\tau = I\underline{(Area)}B$$

$$\vec{\mu} = I\vec{Area}$$



$$\mu_0 = 4\pi\times10^{-7}$$

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