

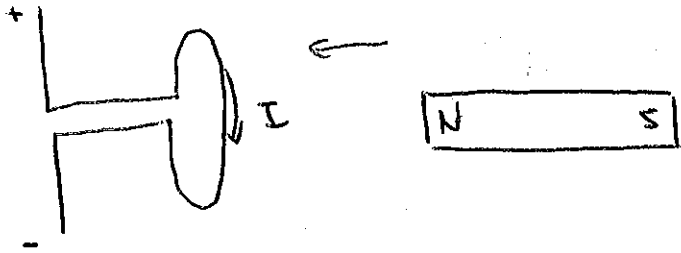
LECTURE FRIDAY [FIRST TORQUE + MOTOR]

DEMO. EM 412 FARADAY'S LAW OVERHEAD



MAGNETIC FLUX

$$\Phi_B = \int \vec{B} \cdot d\vec{A}$$

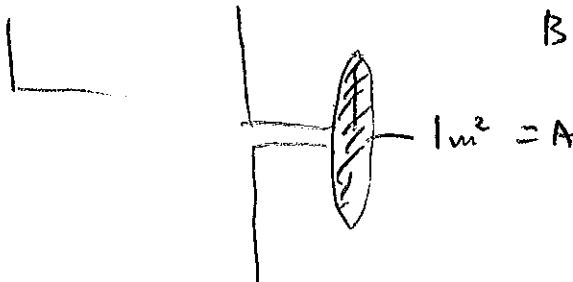


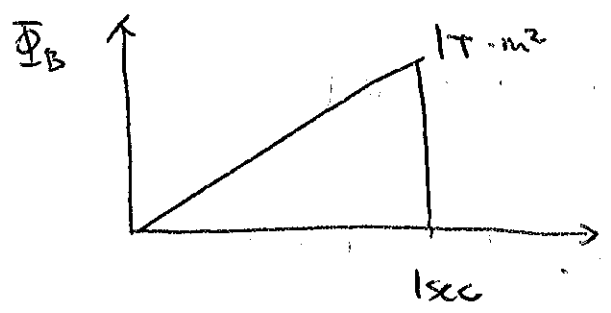
$$\mathcal{E} = - \frac{d\Phi_B}{dt}$$

EXAMPLE

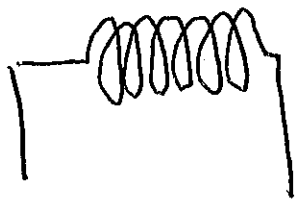
$$B = 0.1 \text{ T} \quad t = 0.5 \text{ sec}$$

$$B = 1 \text{ T} \quad t = 1 \text{ sec}$$





$$\mathcal{E} = - \frac{d\Phi_B}{dt} = -1V$$

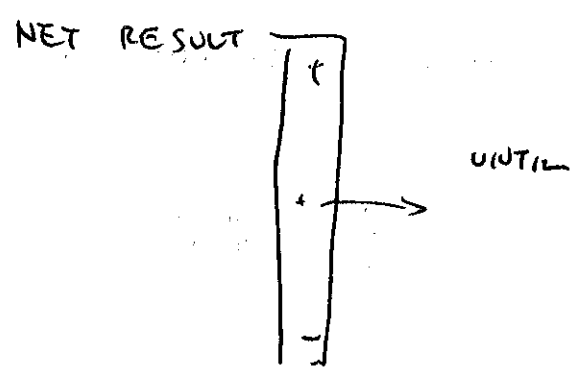
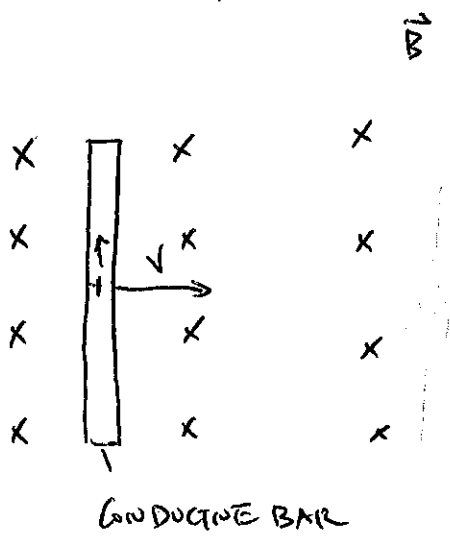


$$\mathcal{E} = -N \frac{d\Phi_B}{dt}$$

N = 200 coil

$$\mathcal{E} = -200V$$

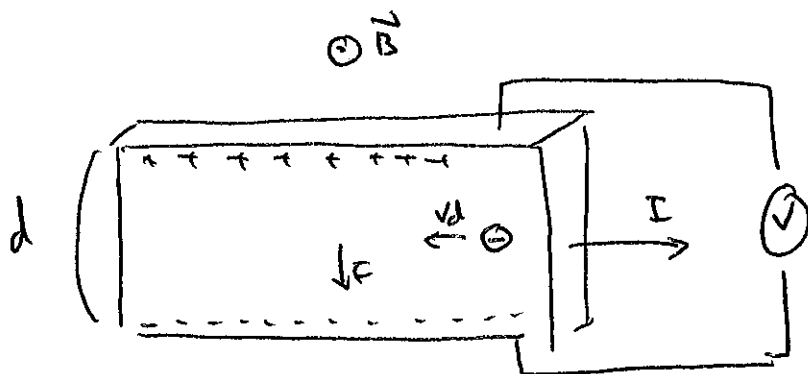
# MOTIONAL EMF



$$\oint E = \oint v \times B$$

$$E = v \times B$$

# HALL EFFECT



EDWIN HALL : 1855 - 1938

SUPPOSE ELECTRONS ARE THE MAIN CHARGE CARRIER

~~v = I / qA~~

$$\vec{F} = q\vec{v} \times \vec{B}$$

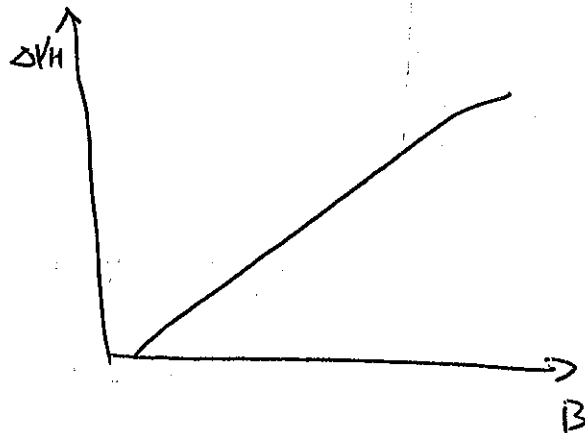
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STOPS WHEN

$$q\vec{E} = q\vec{v} \times \vec{B}$$

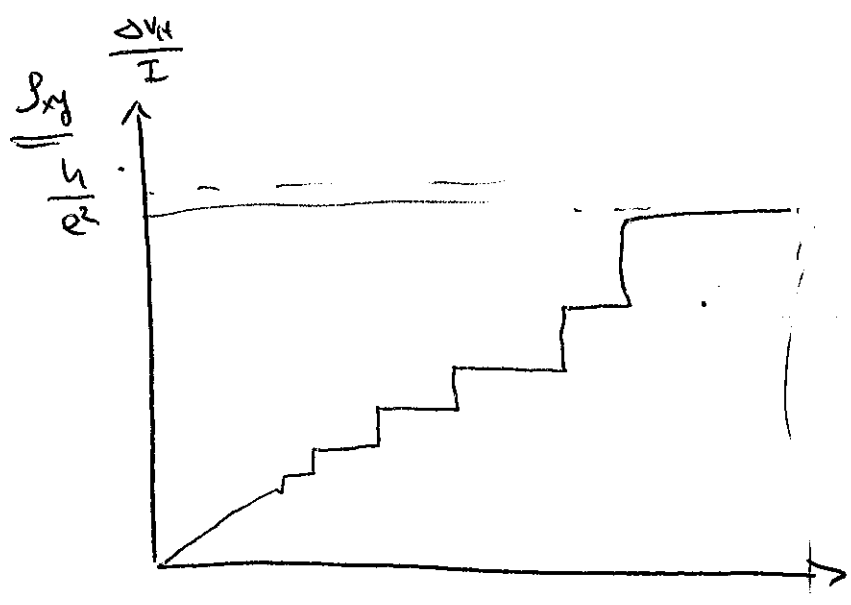
$$E = vB$$

$$E_H = v_d B$$



$$\Delta V_H = E_H d = v_d B d$$

# QUANTUM HALL EFFECT



R

RESISTANCE STANDARD

SIMILARLY...

STOP HERE

