MAG. OBVODY

1) A.Z. $\oint \vec{H} \cdot d\vec{l} = I$

2) Φ magnetický v obvodu $\quad \overline{P} = B \cdot S$

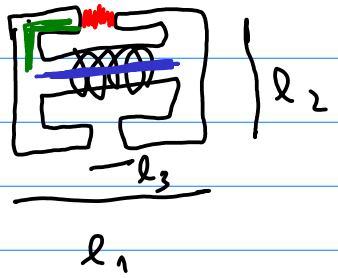
3) $\vec{B} = \mu_0 \vec{H} + \vec{P}_m = \mu_0 (1 + \chi_m) \vec{H} = \mu \vec{H}$

$$\oint \vec{H} \cdot d\vec{l} = n I$$

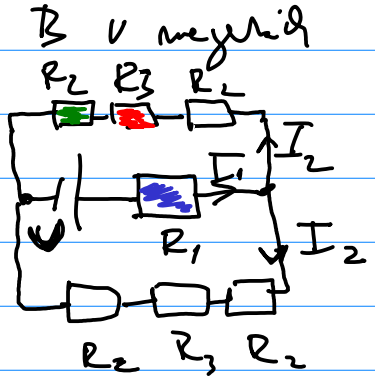
$$\oint \frac{B}{\mu} \cdot dl = n I$$

$$\underbrace{\Phi}_{\text{"I"}} \underbrace{\oint \frac{dl}{\mu S}}_{\text{"R"}} = \underbrace{n I}_{\text{"U"}} \qquad \text{(Ampérův z.)}$$

3.2.5 S



B v mezeře



$$I_2 = \frac{I_1}{2}$$

$$I_1 = \frac{U}{R}$$

$$R = R_1 + \frac{1}{\frac{2}{R_3} + \frac{1}{2R_2}}$$

$$R = R_1 + R_2 + \frac{R_3}{2}$$

$$I_2 = \frac{U}{2} \cdot \frac{1}{R_1 + R_2 + \frac{R_3}{2}}$$

nI ← U

I_2 → Φ_2

$$R_1 \to \frac{l_1}{\mu S} \qquad R_2 \to \frac{\frac{l_1}{2} + \frac{l_2}{2}}{\mu S}$$

$$R_3 = \frac{l_3}{\mu_0 S} \qquad R_1 + R_2 + \frac{R_3}{2} \rightarrow$$

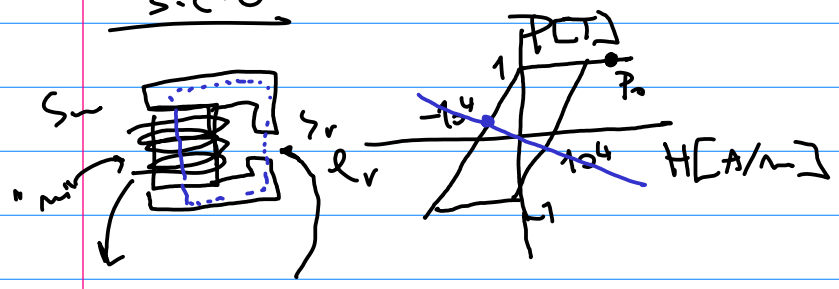
$$\Phi_2 = \frac{1}{2} \frac{NI}{\frac{l_2 + l_1}{\mu S} + \frac{1}{2}\frac{l_3}{\mu_0 S}}$$

$$\mu \gg \mu_0 \qquad \Phi_2 = \frac{\mu_0 N I S}{l_3}$$

$$B = \frac{\Phi_2}{S} = \frac{\mu_0 N I}{l_3}$$

PERMANENTNT MAGNET

3.2.6



P_m vs H_m

1) $B_m = \mu_0 H_m + P_m$

2) $B_v = \mu_0 H_v$

3) $B_m \cdot S_m = B_v \cdot S_v$

A.t.: $\oint H dl = 0$

4) $H_m \cdot l_m = -H_v \cdot l_v$

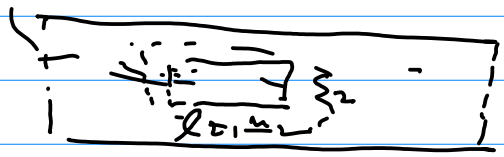
5) $P_m(H_m)$

$$P_m = H_s \cdot \left(-\mu_0 \left(\frac{S_v l_m}{S_m l_v} + 1 \right) \right) = -5 \mu_0 H_m$$

$$= -20\pi \cdot 10^{-7} H_s$$

$P_m = \dots \quad H = \dots \quad \longrightarrow$

3.4.12 (INDUKTIVITÄT)



$\Phi = I \cdot L$

$\Phi_1 = L_{11} I_1 + L_{12} I_2$

$\Phi_2 = L_{21} I_1 + L_{22} I_2$

$\Phi_2 \quad (I_2 = 0, I_1 \neq 0)$

$B_1 = \mu_0 n_1 I_1$

$\Phi_2 = B_1 \cdot n_2 \cdot l_2 \cdot S_2 = \underbrace{\mu_0 n_1 n_2 l_2 S_2}_{L_{21}} I_1$

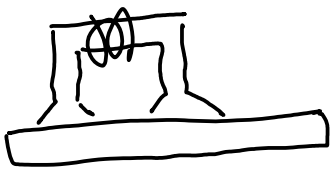
$L_{12} = L_{21}$

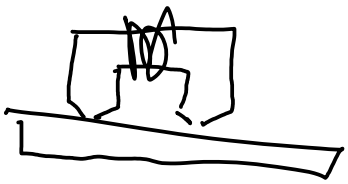
$\Phi_1 = \int_{S_1} \vec{B}_1 \, d\vec{S}_1 = \int_{S_1} (\nabla \times \vec{A}_{21}) \, d\vec{S} = \oint_{l_1} \vec{A}_{21} \, d\vec{l}_1$

$\vec{A}_{21} = \frac{\mu_0 I_2}{4\pi} \oint \frac{d\vec{l}_2}{r_{21}} \qquad \Phi_1 = \frac{\mu_0 I_2}{4\pi} \oint_{l_1} \oint_{l_2} \frac{d\vec{l}_1 \, d\vec{l}_2}{r_{12}}$

$\Rightarrow L_{12} = L_{21}$

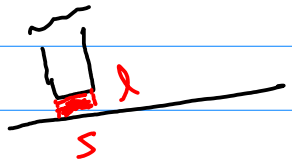
3.5.8 + 3.5.9





$F = ?$

$$w = \frac{1}{2} \vec{B} \cdot \vec{H} \qquad W = \frac{1}{2} \frac{B^2}{\mu_0} \cdot l \cdot S$$



$$= \frac{1}{2} \frac{\Phi^2}{\mu_0 S} \cdot l$$

$$F = \frac{\partial W}{\partial l} = \frac{1}{2} \frac{\Phi^2}{\mu_0 S}$$

$$\hat{I} = I_0 e^{i\omega t}$$

$$\hat{U} = U_0 e^{i\omega t}$$

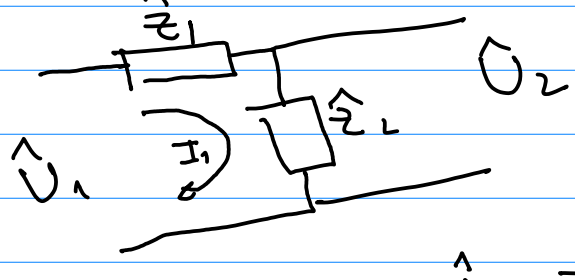
$\hat{z}$ $\qquad \hat{U} = \hat{z} \hat{I}$

ohm $\quad \hat{z} = R$

kond. $\quad \hat{z} = \frac{1}{i\omega C} \quad \left(Q = UC \quad I = C \frac{dU}{dt} \right)$

civ) $\quad \hat{z} = i\omega L \quad \left(U = L \frac{dI}{dt} \right)$

FILTR

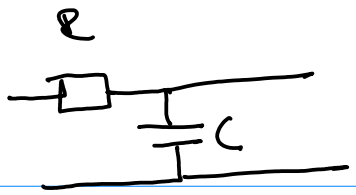


$U_2 = f(U_1)$

$$\hat{I}_1 = \frac{\hat{U}_1}{\hat{z}_1 + \hat{z}_2}$$

$$\hat{U}_2 = \hat{z}_2 \cdot \frac{1}{\hat{z}_1 + \hat{z}_2} \cdot U_1$$

$$\frac{\hat{z}_2}{\hat{z}_1 + \hat{z}_2}$$



$$\frac{\hat{z}_2}{\hat{z}_1 + \hat{z}_2} = \frac{\frac{1}{i\omega C}}{R + \frac{1}{i\omega C}}$$

$$= \frac{1}{i\omega RC + 1}$$

DÚ
(dobrovolné)