elektrika

$\vec{F} = \frac{e_1 e_2}{4\pi\varepsilon_0 r^2} \frac{\vec{r}}{|\vec{r}|}$ točke

$\int_{\partial D} \vec{E} d\vec{S} = \frac{1}{\varepsilon_0} \sum_D e_i$ blob

polna krogla: $E(r) = \begin{cases} \frac{e}{4\pi\varepsilon_0 r^2}; & r \geq R \\ \frac{e\,r}{4\pi\varepsilon_0 R^3}; & r \leq R \end{cases}$

votla krogla: $E(r) = \begin{cases} 0; & r < R \\ \frac{e}{4\pi\varepsilon_0 r} \end{cases}$

$e = \varepsilon_0 \oint_S \vec{E}\,\vec{n}\,dS$ $\quad \vec{F} = e\vec{E}$

Ploščа: $E = \frac{\sigma}{2\varepsilon_0}$ $\quad \sigma$ ... ploščinska gostota

2 plošči (kondenzator) $E = \frac{\sigma}{\varepsilon_0}$

$C = \frac{e}{U}$ $\quad [F = \frac{As}{V}]$ $\quad C = \varepsilon_0 \frac{S}{d}$

$R = \varrho \frac{l}{S}$ $\quad U = RI$ $\quad U = Ed$

$W_{pe} = eU$ $\quad P = IU = I^2R = \frac{U^2}{R}$

Vzporedna vezava: $R = \sum R_i$; zaporedna: $\frac{1}{R} = \sum \frac{1}{R_i}$

Polnjenje kondenzatorja: $e(t) = CU_g\left(1 - e^{-\frac{t}{RC}}\right)$

Praznenje kondenzatorja $e(t) = CU\,e^{-\frac{t}{RC}}$

Magnetno polje

$j_e = \operatorname{rot}\vec{B} = \frac{I}{S}$ ... gostota el. toka

$\vec{B} = \mu_0 \vec{H}$ ← jakost

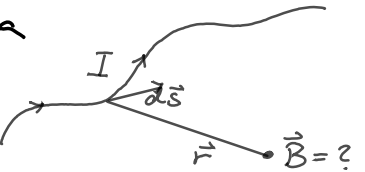
$\mu_0 = 4\pi \cdot 10^{-7} \frac{Vs}{Am}$

$I = \frac{1}{\mu_0} \oint \vec{B} d\vec{s}$

$B = \frac{\mu_0 I}{2\pi r}$ ob žici

Biot-Savartova enačba

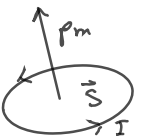
$\vec{B} = \frac{\mu_0 I}{4\pi} \int_{po\,žici} \frac{\vec{r} \times d\vec{s}}{r^3}$



Lorentzova sila: $\vec{F} = e(\vec{E} + \vec{v} \times \vec{B})$

$W = -\int \vec{F}_e d\vec{s}$

$W_e = -e\vec{E}\vec{s} = -\int \vec{E}(\vec{r}) d\vec{s} = -\vec{F}_e \vec{s}$



$p_m = I \cdot S$ ($\vec{p}_m = NI\vec{S}$

$M = \vec{p}_m \cdot \vec{B} = \vec{r} \times F_m$ $dA = Fr d\varphi = M d\varphi$

$\vec{F}_{žice} = I\vec{l} \times \vec{B}$

indukcija

$$\Phi_m = \vec{B} \cdot \vec{S} = \int_S \vec{B}\, d\vec{S}$$

Φ_m hoče ostati isti

$$U_i = B \cdot d \cdot v = \frac{d\Phi_m}{dt}$$

$$U_i = (\vec{d} \times \vec{B})\vec{v}$$

$$\Phi_m = LI$$

$$L = \mu_0 N^2 S/l$$

$$M = J\alpha$$

$$[T] = \left[\frac{Ns}{Cm}\right] = \left[\frac{kg}{As^2}\right] = \left[\frac{N}{Am}\right] = \left[\frac{J}{Am^2}\right] = \left[\frac{Vs}{m^2}\right]$$

$$[V] = \left[\frac{Nm}{As}\right] = \left[\frac{W}{A}\right]$$

$$[N] = \left[\frac{kgm}{s^2}\right]$$

$$[J] = [Nm]$$

$$[W] = \left[\frac{Nm}{s}\right] = \left[\frac{J}{s}\right]$$

$$[\Omega] = \left[\frac{Nm}{A^2 s}\right] = \left[\frac{V}{A}\right]$$

$$[F] = \left[\frac{A^2 s^2}{Nm}\right] = \left[\frac{A}{V}s\right]$$

$$[H] = \left[\frac{Nm}{A^2}\right] = \left[\frac{V}{A}s\right]$$

μ: 10^{-6}

n: 10^{-9}