

ELEKTRIKA

ELEKTRIČNO POLJE

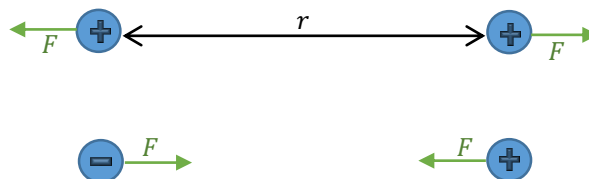
ELEKTRIČNA SILA (Columbov zakon)

$$F = \frac{e_1 \cdot e_2}{4\pi \cdot \varepsilon_0 \cdot r^2}$$

e je električni naboj, $e = N \cdot e_0$

e_0 je osnovni električni naboj, $e_0 = 1,6 \cdot 10^{-19} \text{ C}$ ($\text{C} = \text{As}$)

ε_0 je influenčna konstanta, $\varepsilon_0 = 8,8 \cdot 10^{-12} \frac{\text{C}^2}{\text{Nm}^2}$



JAKOST ELEKTRIČNEGA POLJA

Električno polje je prostor, v katerem na električni naboj deluje električna sila. Gostota silnic je merila jakosti električnega polja.

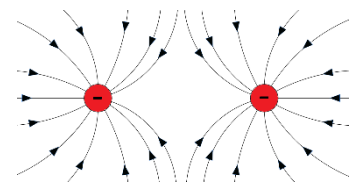
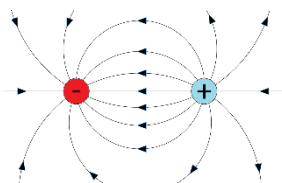
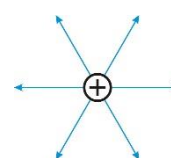
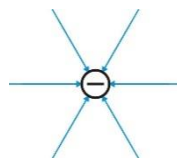
$$F = e \cdot E$$

$$E = \frac{e}{4\pi \cdot \varepsilon_0 \cdot r^2}$$

Ploskovna gostota naboja: $\sigma = \frac{e}{S} \left[\frac{\text{C}}{\text{m}^2} \right]$

Prostor: $E = \frac{\sigma}{\varepsilon_0} = \frac{e}{S \cdot \varepsilon_0}$

Okolica ravne plošče: $E = \frac{\sigma}{2\varepsilon_0} = \frac{e}{2S \cdot \varepsilon_0}$

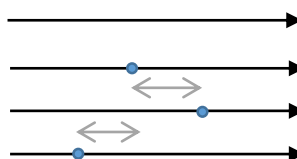


ELEKTRIČNA NAPETOST

$$U = E \cdot h$$

$$U = V_1 - V_2$$

$$A = e \cdot E \cdot h = e \cdot U$$



h = razdalja v smeri silnic

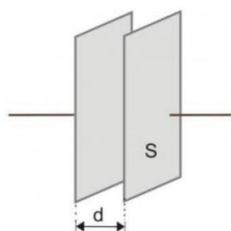
KONDENZATOR

$$C = \frac{e}{U}$$

$$C = \varepsilon_0 \cdot \frac{S}{d}$$

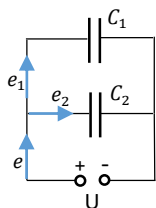
C je kapaciteta kondenzatorja

$$U = E \cdot d = \frac{e \cdot d}{\varepsilon_0 \cdot S} = \frac{e}{C}$$



VEZAVE KONDENZATORJEV:

vzporedna vezava

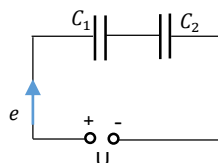


$$e = e_1 + e_2$$

$$U = U_1 = U_2$$

$$C = C_1 + C_2$$

zaporedna vezava



$$e = e_1 = e_2$$

$$U = U_1 + U_2$$

$$\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2}$$

GIBANJE DELCEV V ELEKTRIČNEM POLJU

$$a = \frac{e \cdot E}{F}$$

$$m_{\text{protona}} = 1,67 \cdot 10^{-27} \text{ kg}$$

$$m_{\text{elektrona}} = 9,1 \cdot 10^{-31} \text{ kg}$$

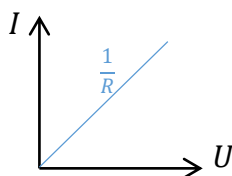
ELEKTRIČNI TOK = gibanje elektronov

Električni tok teče v smeri, v kateri se potencial zmanjšuje (+ → -).

$$I = \frac{\Delta e}{\Delta t} [\text{A}]$$

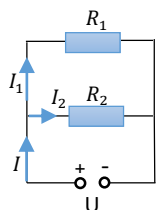
ELEKTRIČNI UPOR R [Ω]

Ohmov zakon: $U = R \cdot I$



VEZAVE UPOROV:

vzporedna vezava

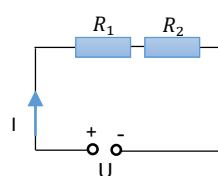


$$U = U_1 = U_2$$

$$I = I_1 + I_2$$

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

zaporedna vezava



$$U = U_1 + U_2$$

$$I = I_1 = I_2$$

$$R = R_1 + R_2$$