ELEKTROMAGNETSKA POLJA – formule by Wolfman– I. ciklus

TOČKASTI NABOJ

$$E = \frac{Q}{4\pi\varepsilon} \cdot \frac{1}{r} \qquad \varepsilon = \varepsilon_0 \cdot \varepsilon_r, \;\; \varepsilon_0 = 8.854 \cdot 10^{-12}$$

$$\varphi = \frac{Q}{4\pi\varepsilon} \cdot \left(\frac{1}{r} - \frac{1}{r_{ref}}\right) \qquad najčešće\ je\ r_{ref} = 0, time\ i\ \varphi(r_{ref}) = 0$$

$$U_{AB} = \frac{Q}{4\pi\varepsilon} \cdot \left(\frac{1}{r_A} - \frac{1}{r_B}\right)$$

LINIJSKI NABOJ

$$E = \frac{\lambda}{2\pi\varepsilon} \cdot \frac{1}{r} \qquad \boldsymbol{r}\ je\ udaljenost\ točke\ od\ linijskog\ naboja$$

$$\varphi = \frac{\lambda}{2\pi\varepsilon} \cdot \ln\left(\frac{r_{ref}}{r}\right)$$

$$U_{AB} = \frac{\lambda}{2\pi\varepsilon} \cdot \ln\left(\frac{r_A}{r_B}\right)$$

$$E = \frac{\lambda}{2\pi\varepsilon r} \cdot \frac{L}{\sqrt{\left(\frac{L}{2}\right)^2 + r^2}} \qquad \boldsymbol{r}\ je\ udaljenost\ točke\ od\ sredine\ linije$$

TANKI PRSTEN

$$E_z = \frac{\lambda \cdot r_0}{2\varepsilon} \cdot \frac{z}{(r_0^2 + z^2)^{\frac{3}{2}}} \qquad \boldsymbol{z}\ je\ udaljenost\ točke\ od\ prstena, \boldsymbol{r_0}\ je\ radijus\ prstena$$

$$\varphi = \frac{\lambda \cdot r_0}{2\varepsilon} \cdot \frac{1}{(r_0^2 + z^2)^{\frac{3}{2}}}$$

DISK

$$E_z = \frac{\sigma}{2\varepsilon} \cdot \left(1 - \frac{z}{\sqrt{R_0^2 + z^2}}\right)$$

$$\varphi = \frac{\sigma}{2\varepsilon} \cdot \left(\sqrt{R_0^2 + z^2} - z\right)$$

VIJENAC

$$E_z = \frac{\sigma z}{2\varepsilon} \cdot \left(\frac{1}{\sqrt{R_1^2 + z^2}} - \frac{1}{\sqrt{R_2^2 + z^2}}\right)$$

$$\varphi = \frac{\sigma}{2\varepsilon} \cdot \left(\sqrt{R_2^2 + z^2} - \sqrt{R_1^2 + z^2}\right)$$

KUGLASTI KONDENZATOR

$$\varphi = \frac{\varphi_0}{\frac{1}{R_1} - \frac{1}{R_2}} \cdot \left(\frac{1}{r} - \frac{1}{R_2}\right)$$ *možda tu ispred ide* ***minus****, a možda i ne*

$$C = 4\pi\varepsilon \cdot \frac{R_1 R_2}{R_2 - R_1}$$

$$\vec{E} = -\nabla\varphi = \frac{R_1 R_2}{R_2 - R_1} \cdot \frac{\varphi_0}{r^2}$$

CILINDRIČNI KONDENZATOR

$$\varphi = \varphi_0 \frac{\ln\left(\frac{R_2}{r}\right)}{\ln\left(\frac{R_2}{R_1}\right)}$$

$$C = 2\pi\varepsilon \frac{l}{\ln\left(\frac{R_2}{R_1}\right)}$$ ***l*** *je duljina cilindričnog kondenzatora*

$$\vec{E} = \overrightarrow{Q_R} \frac{\varphi_0}{r \ln\left(\frac{R_2}{R_1}\right)}$$
