

**Subject:** napake v učbeniku Antene in razširjanje valov

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Pozdravljeni,

v učbeniku našel sem sledeči napaki:

1. Tukaj je verjetno mišljeno  $\cos(\theta_{TX}) = d_{TX}/r_{TX}$  ?

Uklon valovanja na krožni odprtini

Neusmerjen oddajnik

$$E = \alpha I \frac{e^{-jkr}}{r}$$

$\rho \rightarrow \infty$

$$E_{\infty} = \alpha I \frac{e^{-jk(d_{TX} + d_{RX})}}{d_{TX} + d_{RX}}$$

$r_{TX} = \sqrt{d_{TX}^2 + \rho^2}$

$\cos \Theta_{TX} = \frac{d_{TX}}{r_{TX}}$

$r_{RX} = \sqrt{d_{RX}^2 + \rho^2}$

$\cos \Theta_{RX} = \frac{d_{RX}}{r_{RX}}$

$\alpha I = E_{\infty} \frac{d_{TX} + d_{RX}}{e^{-jk(d_{TX} + d_{RX})}}$

$\int_0^{2\pi} dA = \int_0^{2\pi} \rho d\rho d\phi = 2\pi \rho d\rho$

$E = E_{\infty} \frac{jk}{4\pi} \frac{d_{TX} + d_{RX}}{e^{-jk(d_{TX} + d_{RX})}} \iint \frac{e^{-jkr_{TX}}}{r_{TX}} \frac{e^{-jkr_{RX}}}{r_{RX}} (\cos \Theta_{TX} + \cos \Theta_{RX}) dA$

$E = E_{\infty} jk \frac{d_{TX} + d_{RX}}{e^{-jk(d_{TX} + d_{RX})}} \int_0^a \frac{e^{-jk(r_{TX} + r_{RX})}}{r_{TX} r_{RX}} \frac{\cos \Theta_{TX} + \cos \Theta_{RX}}{2} \rho d\rho$

2. Približek uklona **NA** krožni odprtini.

## Približek uklona krožni odprtini

$$a \ll d_{TX}, d_{RX} \rightarrow E \approx E_{\infty} jk \frac{d_{TX} + d_{RX}}{2 d_{TX} d_{RX}} \int_0^a e^{-jk \frac{d_{TX} + d_{RX}}{2 d_{TX} d_{RX}} \rho^2} d\rho^2$$

Neposredni žarek

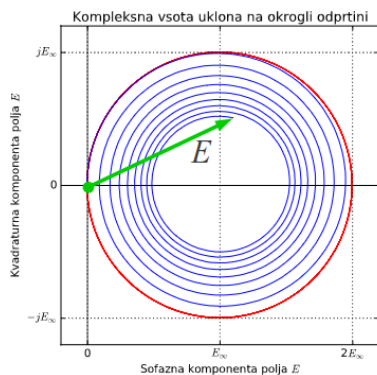
Uklon na robu odprtine

$$E \approx E_{\infty} \left[ 1 - e^{-jk \frac{d_{TX} + d_{RX}}{2 d_{TX} d_{RX}} a^2} \right]$$

Zgled  $\lambda = 10\text{cm}$   
 $d_{TX} = 1\text{m}$   $d_{RX} = 1\text{m}$

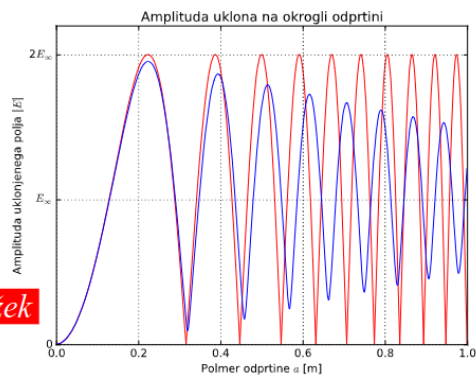
$$|E| \approx 2 \left| E_{\infty} \sin \left( k \frac{d_{TX} + d_{RX}}{4 d_{TX} d_{RX}} a^2 \right) \right|$$

$$\begin{aligned} \cos \Theta_{TX} &\approx 1 \approx \cos \Theta_{RX} \\ \frac{1}{r_{TX} r_{RX}} &\approx \frac{1}{d_{RX} d_{TX}} \\ e^{-jkr_{TX}} &\approx e^{-jkd_{TX}} e^{\frac{-jk\rho^2}{2d_{TX}}} \\ e^{-jkr_{RX}} &\approx e^{-jkd_{RX}} e^{\frac{-jk\rho^2}{2d_{RX}}} \end{aligned}$$



Točno

Približek



Lep pozdrav,

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