ELEKTROMAGNETSKI VALOVI

Valna jednadzba iz Maxwellonih jednodzhi u valennu $\nabla \vec{E} = \frac{\vec{f}}{\vec{E}} = 0$ $\nabla \cdot \vec{B} = 0$ $\nabla \times \vec{E} = \frac{-3}{24} \vec{B}$ $\nabla \times \vec{B} = \mu_0 \vec{J} + \mu_0 \epsilon_0 \frac{d\vec{E}}{dt}$ ales promjere brine et i may taka nastaju samo Zbos myenjanja vektora Z : B : brecens ad toga $\nabla \times \vec{E} = \frac{-\partial}{\partial t} B$ $U \nabla \times \vec{B} = \mathcal{M}_0 \mathcal{E}_0 \frac{d\vec{F}_0}{dt}$ $\overrightarrow{\nabla}_{x}(\overrightarrow{\nabla}_{x}\overrightarrow{E}) = \frac{-3}{3+} \overrightarrow{\nabla}_{x}\overrightarrow{B} = \frac{-3}{3+} (\mu_{o} \mathcal{E} \frac{dE}{dt}) = \mu_{o} \mathcal{E}_{o} \left(-\frac{d^{2}E}{dt^{2}}\right)$ u Remulama $\nabla \times (\nabla \times \alpha) = \nabla (\nabla \cdot \alpha) - \nabla^2 \alpha \qquad \Rightarrow \nabla (\nabla \cdot E) - \nabla^2 E = \mu \cdot E_0 \frac{d^2 E}{at}$ Valna jiamadžba
električnog poga $\nabla^2 \vec{E} = \mu \cdot E_0 \frac{d^2 \vec{E}}{at}$ $\nabla x(\nabla x \vec{B}) = \mu_0 \varepsilon_0 \frac{d}{dt} (\nabla x \vec{E}) = \mu_0 \varepsilon_0 \frac{d}{dt} (\frac{-d}{dt} \vec{E})$ | u formulaire $\frac{1}{c_1}$ Valna jidmantiba May retstoj polja $\nabla^2 \vec{B} + (H_0 E_0) d^2 \vec{B}$ E(P,+) = P(W++BP) kop & sin branom c ngetton Primjir minusoidni val Za el pogé kop se giba u poè xon $E = E_0 \sin(\omega t - kx) \hat{E}$ amplifieda energy $V = k_x \times - kx$ -> 2 Gjeramo da EHV Zadovoljava pomu Haxwellovu jednudělou $\nabla \vec{E} = \frac{\partial}{\partial x} (E_0 \sin(\omega t + x)) \hat{E} \hat{x} \hat{x} \hat{E} + \hat{x}$ ₹ = - Eo Cos(wt - kx) (kx êx) = ; mora bih 0 → k, x 1 € comper sirrenja vala wijde mora lit obsomit a obsision ma songer strenja

el poya E K = 0

Majnetsko polje: musemo na sučan način - B=Bosin (wt-kx) B $\rightarrow \overrightarrow{\nabla} \overrightarrow{B} = 0 \qquad \overrightarrow{\nabla} \overrightarrow{B} = \frac{\partial B}{\partial x} \hat{x} = 0 \rightarrow \overrightarrow{\nabla} \overrightarrow{B}$ $B_{0}(\omega) = 0$ Odnos električnog i magnetsky polja =? B mora 0! Odnos električnog: maj netskog polja Eg- Eo sin (w+ -kx) ĝ - Rotiramo $|\hat{x}|$ \hat{y} \hat{z} | $|\hat{y}|$ | $|\hat{z}|$ $\overrightarrow{\nabla}_{x} \overrightarrow{E} = \frac{-38}{2+} = -k \cdot E_0 \cos (\omega + -kx) \hat{z}$ VAE = - K Ecos (WF TCX) 2 B=Born(w+-kx)B -> = WBocos(w+-kx)B = WBocos(w++kx)B =, -KE. 2 = -WB. B -> B=2 -> somjer sineuja el polja je L na smyjer moj. W = C Bo $\neq \vec{E} \times \vec{B} = \vec{k}$ BIK Kako se val sini? mora viti ista funciju mnus B-Eo sin (wt 6, x) 2 · E = Eo Sim (w+-kxX)y - mag posje u myery z (rón se po z) - et posje u myeru y (rón se po y) => (=+x --> val se siri u smyeru x

Primyr re more imate z korreponentu jer je E = E. 60) (W++K+) (x+2) Z Imyèr vala, a E I K! 尼=-2 E=1 /m = x W- (015-5 rod () $\hat{Q} = \hat{Z} \times \hat{B}$ $\hat{Z} = \hat{Z} \times \hat{B}$ $\mathcal{E}_{\mathbf{o}} = \mathcal{C} \cdot \mathcal{B}_{\mathbf{u}}$ $\mathcal{B}_{\mathbf{o}} = \frac{\mathcal{E}_{\mathbf{o}}}{\mathcal{C}} = \frac{1}{\mathcal{C}} V$ $\hat{g} = -\hat{g}$ Bo = $\frac{1}{C}$ => $\frac{1}{E} = \frac{1}{C} \cos \left(\omega + kz \right) \left(-\hat{g} \right)$ + iako mimus nje) Poyntingov korem ? iskazeti, zupočeti, što znači otkud olijedi Maxiv. meh rad od Lorenzove = smanjenju energije - (energije koja)
sile noi natogima (spremljene u EM polju) - (pe isaunila levoz poviri nu => $W_{em} = \frac{1}{2} \left(\mathcal{E}_0 \mathcal{E}^2 + \frac{1}{\mu_0} \mathcal{B}^2 \right)$ (guntaina EM polis) W = Jemin dV (gustoca Mch En.) $\vec{S} = \frac{1}{U_0} (\vec{E} \times \vec{B})$ Poyntingov $\left[\frac{W}{m^2} \right] \rightarrow wright u smylnu stirenja valutor <math>velstor$ \vec{m} sobstrom no $\vec{E} \times \vec{B} = \vec{E}$ Primyer: E-Eosin (wt-ky) 2 -> S= 10 (ExB) $E_0 = C$ Bo $\frac{E_0}{c}$ 5 = 1 Eo Bo sin2 (wt-ky) g re busim Sreduja S = Eo2
240c S= 1 E. Sn2 (w+-ky) g * Sussich je misto tu i 2000lo bez glave i repa tabo da Laker noc,

Polarizacija - Malusov zakon 1=10 cosće polonizrano $| = | \langle \langle co^2 Q \rangle \rightarrow | = \frac{|o|}{2}$ nepolani Bramo