$$\mathbf{E}(x,y,z)=E_1 e^{-jkz}\,\mathbf{a_x} + E_2 e^{-jkz}\,\mathbf{a_y}$$

$$\mathscr{E}(x,y,z;t) = E_1 \cos(wt - kz)\,\mathbf{a_x} + E_2 \cos(wt - kz)\,\mathbf{a_y}$$

$$\mathscr{E}(x,y,z;t) = E_1 \cos(wt - kz)\,\mathbf{a_x} + E_2 \cos(wt - kz)\,\mathbf{a_z}$$

Geçersiz

$$\mathscr{E}(x,y,z;t) = E_1 \cos(wt - ky)\,\mathbf{a_x} + E_2 \cos(wt - ky)\,\mathbf{a_z}$$

Geçerli (+y yönünde yayılan bir dalga)

$$\mathscr{E}(x,y,z;t) = E_1 \cos(wt - ky)\,\mathbf{a_x}$$

Geçerli

$$\mathscr{E}(x,y,z;t) = E_1 \cos(wt - ky)\,\mathbf{a_x} + E_2 \cos(wt + ky)\,\mathbf{a_x}$$

Geçerli $E_1 \cos(wt - ky)\,\mathbf{a_{x\ bir\ dalga}}$

$E_2 \cos(wt + ky)\,\mathbf{a_{x\ başka\ bir\ dalga}}$

Uzayda $\mathbf{E}(x,y,z)=E_1 e^{-jkz} \mathbf{a_x} + E_2 e^{-jkz} \mathbf{a_y}$

$\mathbf{H}(x,y,z)=?$

$\mathbf{H}(x,y,z)=(1/377)\, \mathbf{a_z} \times \mathbf{E}(x,y,z)$

$= (1/377)\, \mathbf{a_z} \times [E_1 e^{-jkz} \mathbf{a_x} + E_2 e^{-jkz} \mathbf{a_y}]$

$=(1/377)\, [E_1 e^{-jkz} (\mathbf{a_z} \times \mathbf{a_x}) + E_2 e^{-jkz} (\mathbf{a_z} \times \mathbf{a_y})]$

$= (1/377)\, [- E_1 e^{-jkz} \mathbf{a_y} - E_2 e^{-jkz} \mathbf{a_x}]$

$\varepsilon_r = 2$; $\mu_r = 8$ olan bir ortamda $\eta=?$

$\mu = \mu_r \mu_0$

$\varepsilon = \varepsilon_r \varepsilon_0$

$\eta = (\mu / \varepsilon)^{1/2} = (\mu_r \mu_0 / \varepsilon_r \varepsilon_0)^{1/2} =$

$(\mu_r / \varepsilon_r)^{1/2}(\mu_0 / \varepsilon_0)^{1/2} = 2 \,.\, 377 = 754\Omega$

$\varepsilon_r = 3$; $\mu_r = 9$ olan bir ortamda

$\mathbf{E}(x,y,z) = 100\, e^{+jkx}\, \mathbf{a_y} + 150\, e^{+jkx}\, \mathbf{a_z}$ (V/m)

$\mathbf{H}(x,y,z) = ?$

$\mathscr{E}(x,y,z;t) = ?$

$\mathscr{H}(x,y,z;t) = ?$

$\eta = (\mu / \varepsilon)^{1/2} = (\mu_r \mu_0 / \varepsilon_r \varepsilon_0)^{1/2} =$

$(\mu_r / \varepsilon_r)^{1/2}(\mu_0 / \varepsilon_0)^{1/2} = \sqrt{3} \,.\, 377 = 653\Omega$

$\mathscr{E}(x,y,z;t) =$

$100 \cos(wt+kx)\, \mathbf{a_y} + 150 \cos(wt+kx)\, \mathbf{a_z}$ (V/m)

$\mathbf{E}(x,y,z) = 100\, e^{+jkx}\, \mathbf{a_y} + 150\, e^{+jkx}\, \mathbf{a_z}$ (V/m)

$\mathbf{H}(x,y,z) = (1/653)\, -\mathbf{a_x} \times \mathbf{E}(x,y,z)$ (A/m)

$= (1/653)\ -\mathbf{a_x} \times [100\ e^{+jkx}\ \mathbf{a_y} + 150\ e^{+jkx}\ \mathbf{a_z}]$ (A/m)

$= (1/653)\ [-\mathbf{a_z}100\ e^{+jkx} + \mathbf{a_y}150\ e^{+jkx}]$ (A/m)

$\mathscr{H}(x,y,z;t) = (1/653)\ [-\mathbf{a_z}100 \cos(wt+kx) + \mathbf{a_y}150 \cos(wt+kx)]$ (A/m)

$\mathbf{S} = \mathbf{E}(x,y,z) \times \mathbf{H}(x,y,z)$ (Poynting Vektörü) W/m^2 : Dalga cephesinin birim yüzeyinde taşınan güç

$|\ \mathbf{S}\ | = |\ \mathbf{E}\ |.\ |\ \mathbf{H}\ | = |\ \mathbf{E}\ |^2 / \eta = |\ \mathbf{H}\ |^2\ \eta$

$\mathbf{E}(x,y,z) = 100\ e^{+jkx}\ \mathbf{a_y} + 150\ e^{+jkx}\ \mathbf{a_z}$ (V/m)

$|\ \mathbf{E}(x,y,z)| = (100.100 + 150.150)^{1/2}$

$= 180.2$

$|\mathbf{S}| = (180.2)^2 / 653 = 49.77\ W/m^2$