

|   |  |
|---|--|
| $\alpha = \omega \sqrt{\frac{\mu\epsilon}{2} \left( \sqrt{1 + \left( \frac{\sigma}{\omega\epsilon} \right)^2} - 1 \right)}$ | $\beta = \omega \sqrt{\frac{\mu\epsilon}{2} \left( \sqrt{1 + \left( \frac{\sigma}{\omega\epsilon} \right)^2} + 1 \right)}$ |
|---|--|

|  |  |
|--|--|
| $\Gamma_{\perp} = \frac{\eta_2 \cos \theta_s - \eta_1 \cos \theta_{\text{läp}}}{\eta_2 \cos \theta_s + \eta_1 \cos \theta_{\text{läp}}}$ | $\Gamma_{\parallel} = \frac{\eta_2 \cos \theta_{\text{läp}} - \eta_1 \cos \theta_s}{\eta_2 \cos \theta_{\text{läp}} + \eta_1 \cos \theta_s}$ |
|--|--|

|   |
|---|
| $\sin x + \sin y = 2 \sin(0,5 \cdot (x+y)) \cdot \cos(0,5 \cdot (x-y))$<br>$\sin x - \sin y = 2 \cos(0,5 \cdot (x+y)) \cdot \sin(0,5 \cdot (x-y))$<br>$\cos x + \cos y = 2 \cos(0,5 \cdot (x+y)) \cdot \cos(0,5 \cdot (x-y))$<br>$\cos x - \cos y = -2 \sin(0,5 \cdot (x+y)) \cdot \sin(0,5 \cdot (x-y))$ |
|---|

| Suure                   | Tunnus       | Arvo   | Yksikkö          |
|-------------------------|--------------|--|------------------|
| valonnopeus             | $c$          | 299792458  | m/s              |
| tyhjön permeabiliteetti | $\mu_0$      | $4\pi \cdot 10^{-7} \approx 12,566970614 \cdot 10^{-7}$                                | N/A <sup>2</sup> |
| tyhjön permittiivisyyys | $\epsilon_0$ | $\frac{1}{\mu_0 c^2} \approx \frac{10^{-9}}{36\pi} \approx 8,854187817 \cdot 10^{-12}$ | F/m              |