$\Rightarrow z(t) = z_0 \cos(\omega t + \varphi)$

med

$$z_0(\omega) \sim \frac{E_0}{\omega_0^2 - \omega^2} \qquad \text{(jfr Tvungen svingning)}$$

$\Rightarrow$ indusert dipolmoment $\vec{p}(t) = \vec{z}\, p_0(\omega) \cos(\omega t + \varphi)$

med

$$p_0(\omega) = e z_0(\omega) \sim \frac{E_0}{\omega_0^2 - \omega^2}$$

$\Rightarrow$ elektrisk polarisering $P = \frac{\Delta p}{\Delta V} \sim \frac{E_0}{\omega_0^2 - \omega^2}$

$$P = \varepsilon_0 \chi_e E = A \frac{E_0}{\omega_0^2 - \omega^2}$$

$$D = \varepsilon_0 E + P \Rightarrow E = \frac{D}{\varepsilon_0} - \frac{P}{\varepsilon_0} = E_0 - \frac{P}{\varepsilon_0} = E_0 \left\{ 1 - \frac{A/\varepsilon_0}{\omega_0^2 - \omega^2} \right\}$$
$$= \varepsilon_0 \varepsilon_r E$$

$$\Rightarrow \frac{E_0}{\varepsilon_r} = E_0 \left\{ 1 - \frac{A/\varepsilon_0}{\omega_0^2 - \omega^2} \right\}$$

$$\Rightarrow \varepsilon_r(\omega) = n^2(\omega) \approx \left\{ 1 - \frac{A/\varepsilon_0}{\omega_0^2 - \omega^2} \right\}^{-1}$$

$$\Rightarrow n(\omega) \approx \left\{ 1 - \frac{A/\varepsilon_0}{\omega_0^2 - \omega^2} \right\}^{-1/2}$$

} Dispersjon!

Synlig lys: $\omega \ll \omega_0$

$$\Rightarrow n(\omega) \approx \left\{ 1 - \frac{A}{\varepsilon_0 \omega_0^2} - \frac{A\omega^2}{\varepsilon_0 \omega_0^4} \right\}^{-1/2}$$

$$\approx 1 + \frac{A}{2\varepsilon_0 \omega_0^2} + \frac{A\omega^2}{2\varepsilon_0 \omega_0^4} \ldots \approx 1 + K_1 + \frac{K_2}{\lambda^2}$$

$\Rightarrow$ Blått lys ($\lambda_B \sim 400$ nm) brytes mer enn rødt lys ($\lambda_R \sim 700$ nm) i grenseflate luft/dielektrikum