

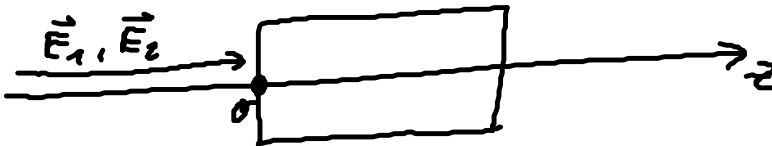
4.3 Bestimmung der Zweiten Harmonischen

$$\vec{e}_1 \cdot \underline{\underline{\epsilon}} \cdot \vec{E}_3 = (e_1, e_2, 0) \begin{pmatrix} \epsilon_{\perp} & 0 & 0 \\ 0 & \epsilon_{\perp} & 0 \\ 0 & 0 & \epsilon_{\parallel} \end{pmatrix} \cdot \begin{pmatrix} e_1 E_{\perp} \\ e_2 E_{\perp} \\ E_{\parallel} \end{pmatrix} \quad |\vec{e}_1| = 1 = e_1^2 + e_2^2$$

$$= (e_1, e_2, 0) \begin{pmatrix} \epsilon_{\perp} e_1 E_{\perp} \\ \epsilon_{\perp} e_2 E_{\perp} \\ \epsilon_{\parallel} E_{\parallel} \end{pmatrix} = \epsilon_{\perp} (e_1^2 + e_2^2) E_{\perp} + 0 = \epsilon_{\perp} E_{\perp}$$

Dgl: $\frac{\partial^2}{\partial z^2} E_{\perp} + \frac{\omega_3^2}{c^2} \epsilon_{\perp} E_{\perp} = - \frac{\omega_3^2}{c^2} \underbrace{\vec{e}_1 \cdot \chi^{(2)} : \vec{M}_1 \vec{M}_2 E_{10} E_{20} \exp\{i(k_1 + k_2)z\}}_{= \chi_{\perp}^{(2)}}$

$$\left(\frac{\partial^2}{\partial z^2} + k^2 \right) E_{\perp}(z, \omega_3) = - \frac{\omega_3^2}{c^2} \chi_{\perp}^{(2)} E_{10} E_{20} \exp\{i(k_1 + k_2)z\} \quad \left| \quad \frac{\omega_3^2}{c^2} \epsilon_{\perp} = k^2 \right.$$

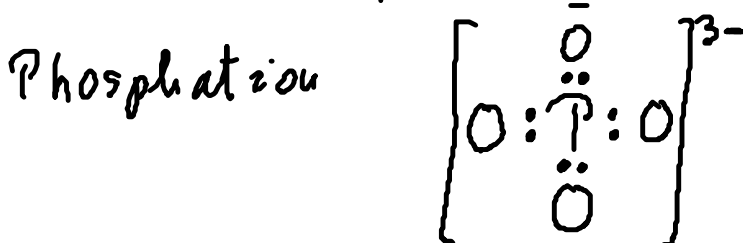


$$e^{i\alpha} - 1 = e^{i\frac{\alpha}{2}} \left(e^{i\frac{\alpha}{2}} - e^{-i\frac{\alpha}{2}} \right) = e^{i\frac{\alpha}{2}} 2i \sin \frac{\alpha}{2}$$

$$v \frac{c^2}{v^2} \epsilon_0 \frac{1}{24 k^2 c^4} \omega_3^3 = \frac{1}{2} \frac{\epsilon_0 \omega_3^3}{4 k^2 c^2} = \frac{\epsilon_0 \omega_3^3}{8 k c^2}$$

Dielektrikum KH_2PO_4

Kalium dihydrogenphat oder **KDP**



K^+
 H^+
 H^+

Kationen

O: 6 Valenzelektronen

P: 5 Valenzelektronen