4 周期极化的铌酸锂晶体 ppLN

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4.1 侧面发射几何 $\Theta_x=\frac{\pi}{2}$ 的 OR

$$E_z(\omega,\boldsymbol{R})=\frac{U_0\eta_0 d_{33}}{2\pi c^2 n_{\mathrm{IR}}}\frac{e^{-ikR}}{R}G(\omega,\tau_{\mathrm{L}})H(\omega,r_0)F(\omega,\Theta_x)\cdot L$$

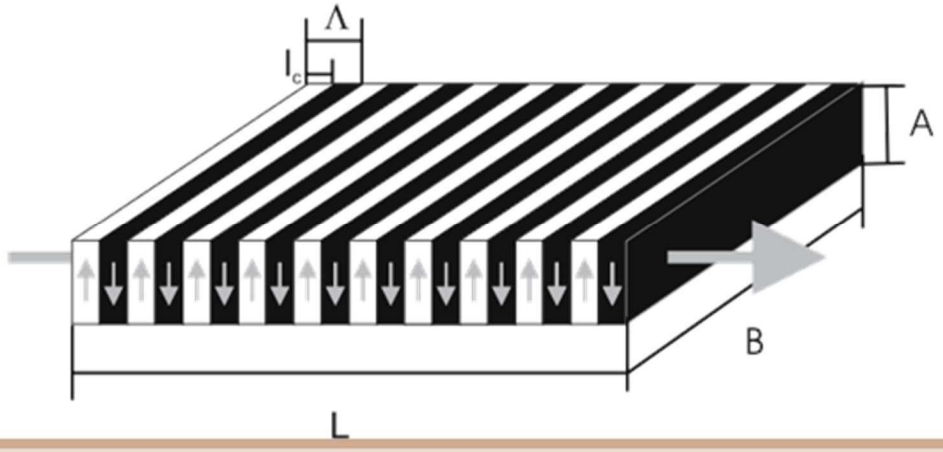
$$E_z(\omega,\boldsymbol{R})=\frac{U_0\eta_0}{2\pi c^2 n_{\mathrm{IR}}}\frac{e^{-ikR}}{R}\omega^2 e^{-\frac{\omega^2\tau_{\mathrm{L}}^2}{4}}e^{-\frac{\omega^2\tau_a^2}{4}}\int_{-L/2}^{L/2}d_{eff}(x)e^{-i\frac{\omega}{c}\Delta n(\Theta_x)x}\,dx$$

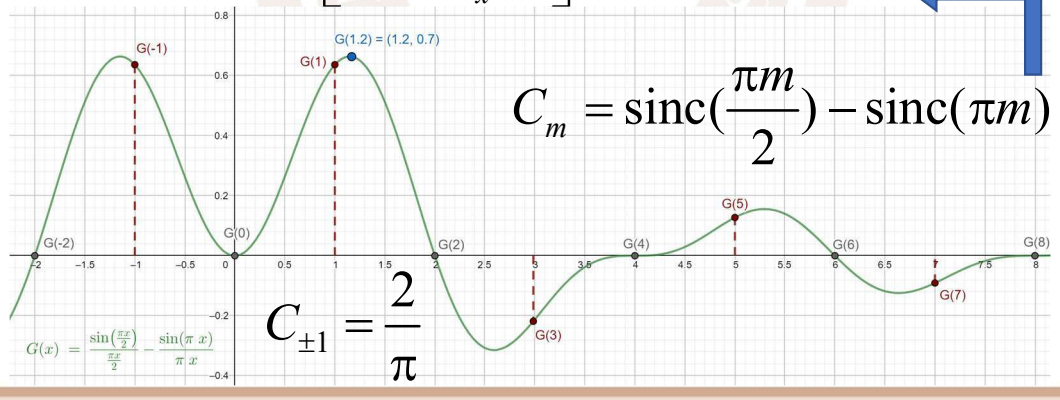
$$F(\omega,\Theta_x)=C_m\,\mathrm{sinc}\left(\frac{[\Delta k_x(\Theta_x)+G_m]\cdot L}{2}\right)$$

$$=C_m\,\mathrm{sinc}\left(\frac{L}{2}\left[-\omega\frac{\Delta n(\Theta_x)}{c}+\frac{2\pi m}{\Lambda_x}\right]\right)$$

$$=C_m\,\mathrm{sinc}\left(\frac{\Delta n(\Theta_x)\cdot L}{2c}\left[\omega-\frac{2\pi cm}{\Delta n(\Theta_x)\cdot\Lambda_x}\right]\right)$$

$$d_{eff}(x)=d_{33}\cdot\mathrm{sgn}\left[\cos\left(\frac{2\pi}{\Lambda_x}z\right)\right]=d_{33}\cdot\sum_{m=-\infty}^{+\infty}C_m e^{iG_m x}$$





$$C_m=\mathrm{sinc}\left(\frac{\pi m}{2}\right)-\mathrm{sinc}(\pi m)$$

$$C_{\pm1}=\frac{2}{\pi}$$

① F 代表 sinc 高频振荡，之前是以 ω = 0 为中心的 sinc，或 1 | ② 振荡 中心频率 可调