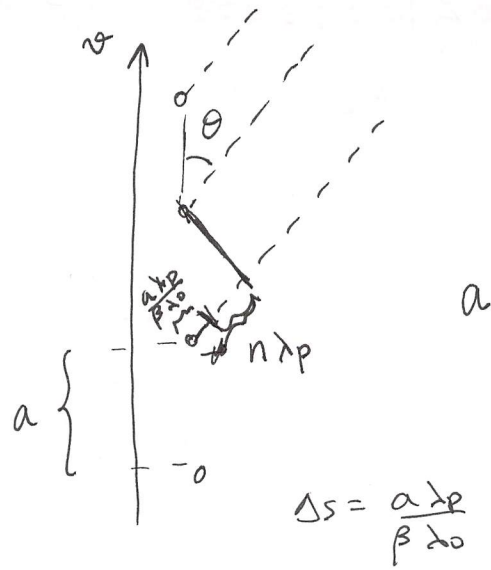
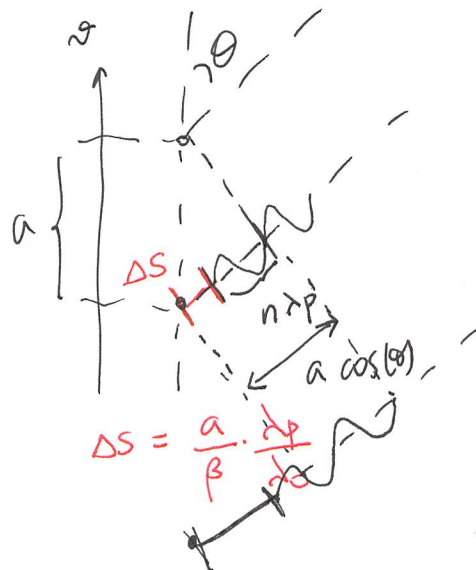


06/03/2023



$$\Delta S = \frac{a \lambda_p}{\beta \lambda_0}$$



$$\Delta S = \frac{a}{\beta} \cdot \frac{\lambda_p}{\lambda_0}$$

$$a \cos(\theta) = n \lambda_p + \Delta S \quad \Rightarrow \quad n \lambda_p = a \cos(\theta) - \Delta S$$

$$\begin{aligned} \theta &= \arccos \left(\frac{n \lambda_p}{a} + \frac{\Delta S}{a} \right) = \arccos \left(\frac{n \lambda_p}{a} + \frac{1}{\beta} \cdot \frac{\lambda_p}{\lambda_0} \right) \\ &= \arccos \left[\lambda_p \left(\frac{n}{a} + \frac{1}{\beta \lambda_0} \right) \right] \end{aligned}$$

Light: $n \lambda = \frac{a}{\beta} - a \cos(\theta)$

$$\vec{K}_{n||} = \left(\frac{\omega}{v} - \frac{2n\pi}{a}, k_y \right) = k_p \left(\cos(\theta_n), \sin(\theta_n) \right)^0$$

$$\begin{aligned} \cos(\theta_n) &= \left(\frac{\omega}{v} - \frac{2n\pi}{a} \right) \frac{\lambda_p}{2\pi} \\ &= \lambda_p \left(\frac{\omega c}{2\pi \beta c} - \frac{n}{a} \right) \\ &= \lambda_p \left(\frac{k_0}{2\pi \beta} - \frac{n}{a} \right) \\ &= \lambda_p \left(\frac{1}{\lambda_0 \beta} - \frac{n}{a} \right) \end{aligned}$$

$$\sin(\theta_n) = \frac{k_y}{k_p}$$

$$k_y^n = \sqrt{k_p^2 - k_{nn}^2}$$



$$\begin{aligned} &e^{i(-k_n + \omega/v)a_j} \\ &= e^{i((-k_n + \omega/v)a_j)} = 2\pi i n \\ &= e^{i((-k_n + \omega/v)a_j)} = 2\pi i n \\ &\Rightarrow -k_n a_j = 2\pi n - \frac{\omega a_j}{v} \\ &\Rightarrow k_n = \frac{\omega}{v} + \frac{2\pi n}{a_j} \end{aligned}$$