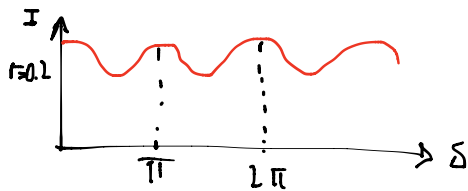
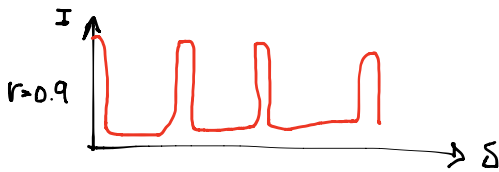


$$T = \frac{1}{1 + \left[\frac{4r^2}{(1-r^2)^2} \right] \sin^2 \frac{\delta}{2}} \quad \delta = 2kd$$

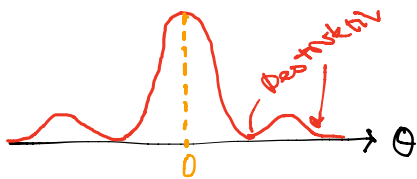
$$F = \frac{4r^2}{(1-r^2)^2} \Rightarrow T = \frac{1}{1 + F \sin^2 \frac{\delta}{2}} \quad r: 0 \rightarrow 1 \quad F: 0 \rightarrow \infty$$



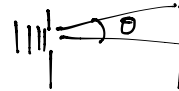
F/r



Böjning



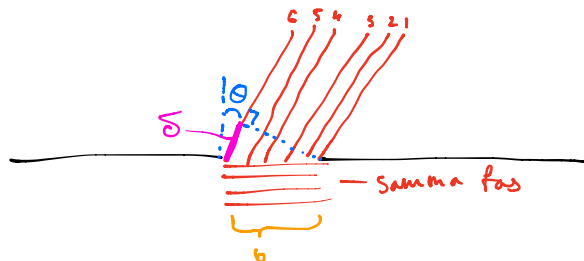
Hur ser det ut?



När får vi minima?

Parvis utsläckning

$$\textcircled{1} + \textcircled{4} = 0 \quad \textcircled{2} + \textcircled{3} = 0$$



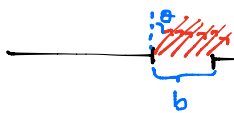
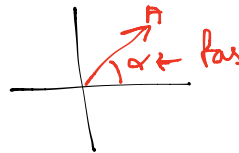
$$\begin{aligned} (2) + (5) &= 0 \\ (3) + (6) &= 0 \end{aligned} \quad \left. \vphantom{\begin{aligned} (2) + (5) \\ (3) + (6) \end{aligned}} \right\} (2)$$

4 ungefär $\frac{1}{2}$ storre än 1

$$\Rightarrow \frac{\delta}{2} \approx \frac{\lambda}{2} \Rightarrow \delta = \lambda \cdot m \quad m = \pm 1, \pm 2, \dots$$

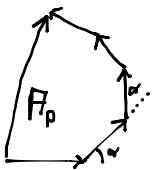
$$\boxed{\delta = b \sin \theta = m \lambda} \quad \text{ger minima i belysning}$$

$$A_{\text{tot}} = A \sin(\omega t - kx)$$

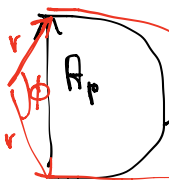


Varje stråle har en lite extra längd

Totala amplituden $A_p = \sum \text{delampl.}$



Hur lång är A_p



$N \rightarrow \infty$

Del av cirkel

$\phi = \text{max fasskillnad}$

Max skillnad i strålen

$$\delta = b \sin \theta \quad \lambda: 2\pi \quad \phi = \delta \frac{2\pi}{\lambda} = \frac{2\pi}{\lambda} b \sin \theta$$

$$\frac{1}{2} A_p = r \sin \frac{\phi}{2}$$

$$\phi = \frac{NA}{r} \Rightarrow r = \frac{NA}{\phi}$$

$$\Rightarrow A_p = 2 \frac{NA}{\phi} \sin \frac{\phi}{2} = NA \frac{\sin \phi/2}{\phi/2}$$

$$\text{Intensitet} = \text{amplitud}^2 = I_p^2$$

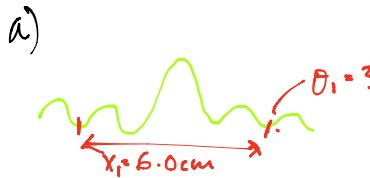
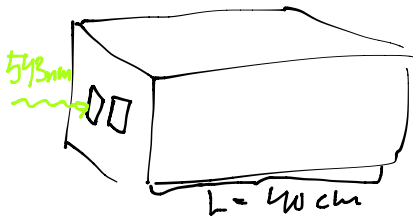
$$I = I_0 \left[\frac{\sin \beta}{\beta} \right]^2$$

$$\beta = \frac{\phi}{2} = \frac{\pi}{\lambda} b \sin \theta$$

$$I=0 \text{ da } \sin \beta = 0 \text{ men } \beta \neq 0$$

$$\beta = m\lambda \quad m = \pm 1, \pm 2, \dots$$

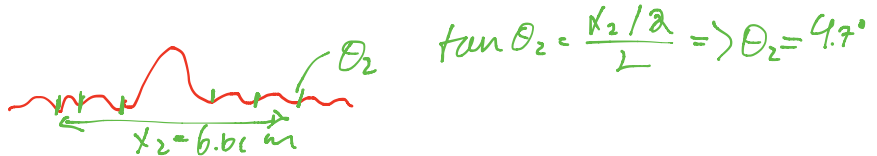
$$\frac{\pi}{\lambda} b \sin \theta = m\pi \Rightarrow b \sin \theta = m\lambda \text{ l\u00f6jningsmin}$$



$$\tan \theta_1 = \left(\frac{3}{40} \right) \quad \theta_1 = 4.3^\circ$$

$$b \sin \theta = m \cdot \lambda \quad m_1 = 2 \Rightarrow b = \frac{2 \cdot 543}{\sin(4.3^\circ)} = 14.5 \mu\text{m}$$

b) tredjemin



$$b \sin \theta_2 = m_2 \frac{\lambda}{n} \quad m_2 = 3 \Rightarrow n = \frac{m_2 \lambda}{b \sin \theta_2} = 1.36$$

Cirkul\u00e5r \u00f6ppning, D

$$\text{Första min } D \sin \theta = 1.22 \lambda$$

$$\text{andra } D \sin \theta = 2.23 \lambda$$

$$\text{höga } D \sin \theta \approx k \lambda \quad k = 0.25 + m$$

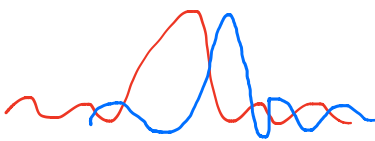


Diametern hos 5:te ringen = 62 mm

$$\tan \theta = \frac{31 \cdot 10^{-3} \text{ m}}{5.00 \text{ m}} \Rightarrow \theta = 0.355^\circ \quad m=5 \quad k = 0.25 + m = 5.25$$

$$D \sin \theta = k \lambda \Rightarrow D = 536 \mu\text{m}$$

Rayleigh kritisk vinkel



$$b \sin \theta_k = 1.22 \lambda$$

$$\theta_k \approx \frac{1.22}{D}$$