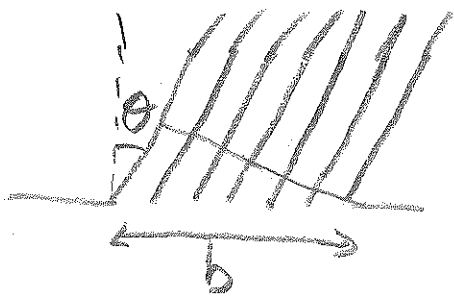


Föreläsning 10 22/04-15

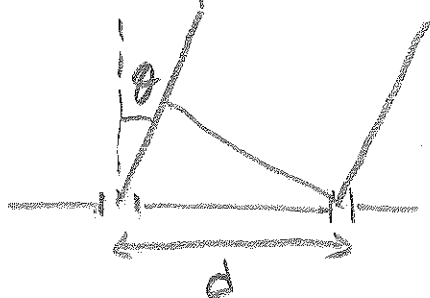
Diffraktion



$$b \sin \theta = m \lambda \quad m = \pm 1, \pm 2, \dots$$

\Rightarrow min

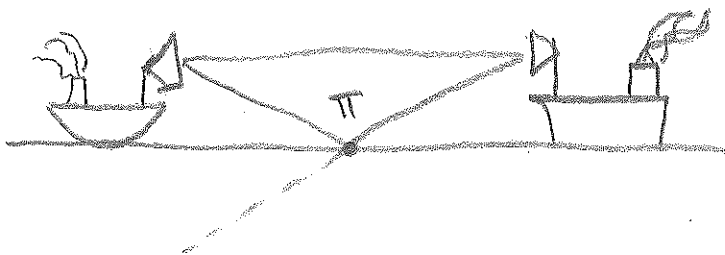
Interferens



$$d \sin \theta = m \lambda \quad m = 0, \pm 1, \pm 2$$

\Rightarrow max

Uppgift



① Huvudmax



$$\alpha = 0, \pm 2\pi, \pm 4\pi, \dots$$

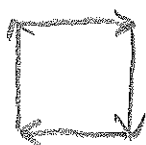
② Det kan finnas flera min mellan två huvudmax



$$\alpha = 90^\circ$$



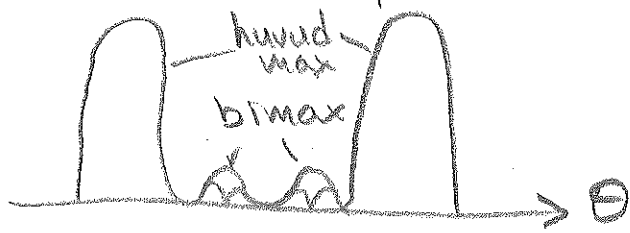
$$\alpha = 180^\circ$$



$$\alpha = 270^\circ$$

$N-1$ minima.

③ ⇒ Det finns $N-2$ lokala max



Uppgift

a) $d \sin \theta = m \lambda$, $d = \frac{\lambda}{2}$

Huvudmax

$\theta = 0^\circ$ eller 180°

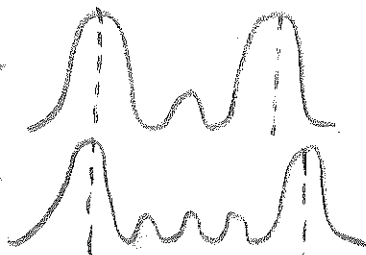


$A_p = NA$

$I = I_0 N^2$

3 spalter

5 spalter



$$I = I_0 \left(\frac{\sin N\delta}{\sin \delta} \right)^2$$

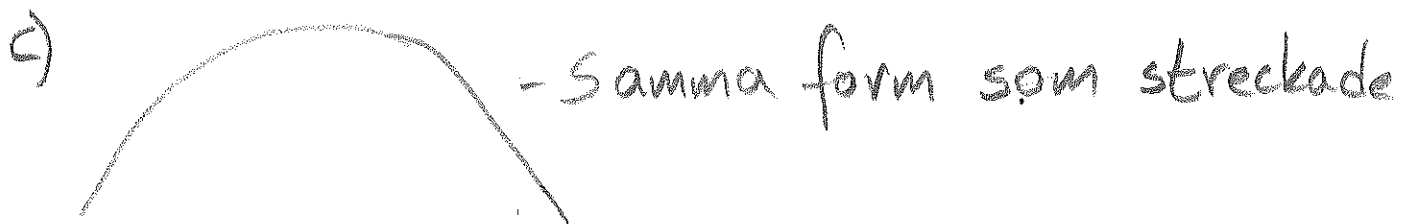
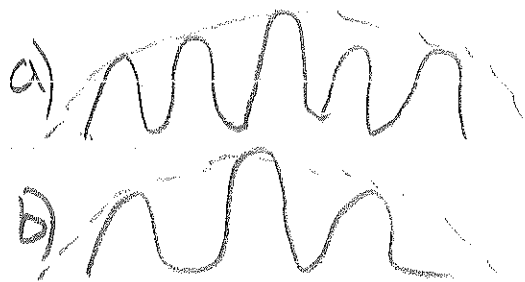
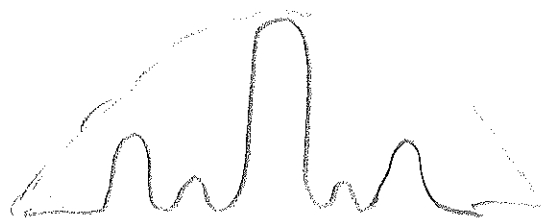
$$r = \frac{\pi}{\lambda} d \sin \theta$$

Böjning & interferens

$\Rightarrow I = I_0 \left(\frac{\sin \beta}{\beta} \right)^2 \left(\frac{\sin N\delta}{\sin \delta} \right)^2$

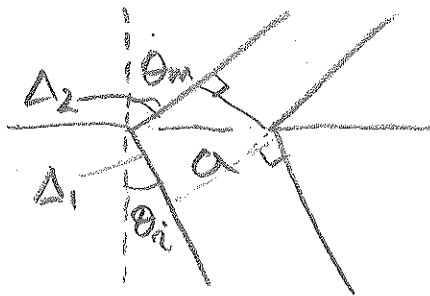
Uppgift

→ A
→ B
→ C



Gitter

Parallella strålar
nu med en vinkel θ

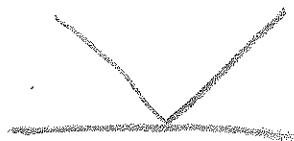


$$\Delta = \Delta_1 + \Delta_2 = a \sin \theta_i + a \sin \theta_m$$

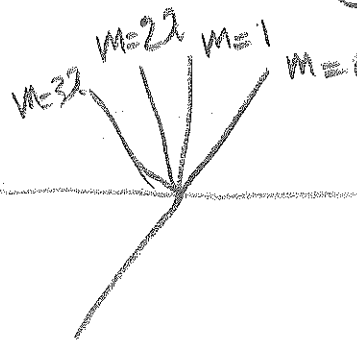
$$\Delta = m \lambda \Rightarrow$$

$$\Rightarrow a (\sin \theta_i + \sin \theta_m) = m \lambda \quad m = 0, \pm 1, \pm 2 \text{ konst. interf.}$$

Nollte ordningen ober. av λ
 Transmissions gitter reflektion



$m \neq 0 \Rightarrow$ våglängdsberoende



Tätare ritsar \Rightarrow större sep.
 men överlappar
 snabbare