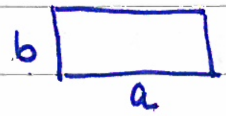
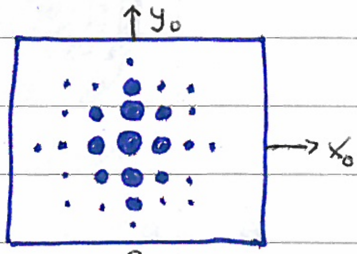
Eks: Rektangulær åpning



$-\frac{a}{2} < x < \frac{a}{2}$ $\qquad$ $-\frac{b}{2} < y < \frac{b}{2}$

$$\Rightarrow I(x_0,y_0) \sim \left\{ \mathrm{Re} \int_{-a/2}^{a/2} dx\, e^{ikx_0x/R} \cdot \int_{-b/2}^{b/2} dy\, e^{iky_0y/R} \right\}^2$$

$$\sim \left(\frac{\sin\alpha}{\alpha}\right)^2 \cdot \left(\frac{\sin\beta}{\beta}\right)^2$$

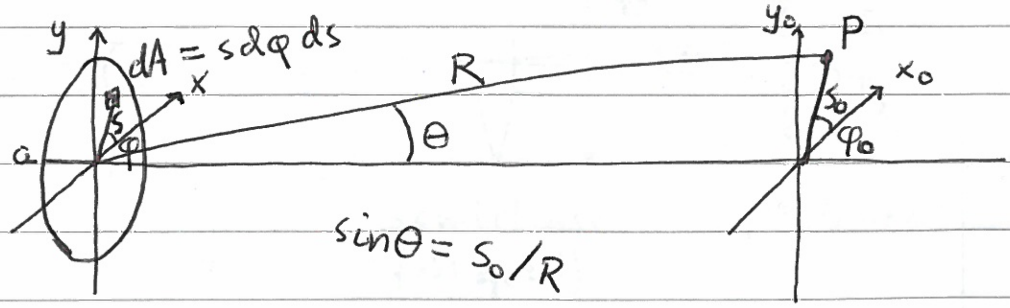


med $\alpha = kx_0a/2R$, $\beta = ky_0b/2R$

[Kommentar: ser at $I \sim \{F(kx_0/R)\cdot G(ky_0/R)\}^2$ der F, G er Fouriertransformasjoner: $F(k) = \int_{-\infty}^{\infty} f(x)e^{ikx}dx$ med $f(x) = \begin{cases} 1 & |x| < \frac{a}{2} \\ 0 & \text{ellers} \end{cases}$]

Eks: Sirkulær åpning

Symmetri $\Rightarrow I(x_0,y_0) \to I(s_0)$; $\quad s_0 = \sqrt{x_0^2 + y_0^2}$



$x = s\cos\varphi$, $y = s\sin\varphi$, $x_0 = s_0\cos\varphi_0$, $y_0 = s_0\sin\varphi_0$

$$\Rightarrow x_0x + y_0y = ss_0\cos(\varphi - \varphi_0)$$

(Integral over s kan gjøres med delvis int.!)

$$\Rightarrow I \sim \left\{ \mathrm{Re} \int_0^a ds \int_0^{2\pi} d\varphi\, s\, e^{ikss_0\cos(\varphi-\varphi_0)/R} \right\}^2 \sim \ldots \sim$$

$$\sim \{ J_1(u)/u \}^2 \;; \quad u = ka\sin\theta = 2\pi a\sin(\theta)/\lambda$$