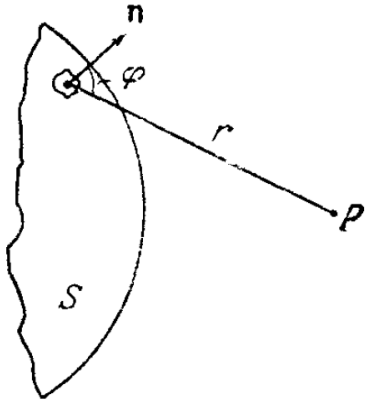
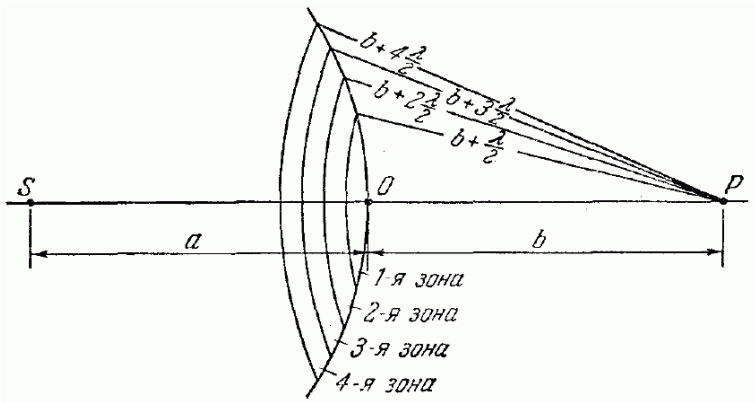
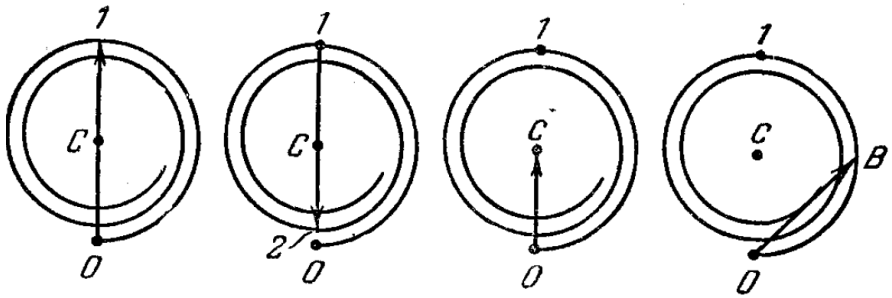
Дифракция Френеля

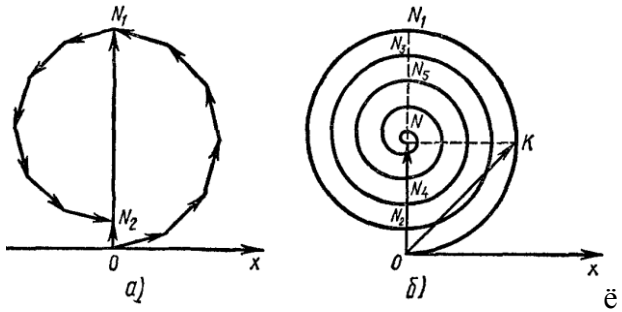




$$\xi = \int_S K(\varphi)\,\frac{a_0}{r}\cos(\omega t - kr + \alpha_0)\,dS$$

$$b_m = b + m\,\frac{\lambda}{2}$$





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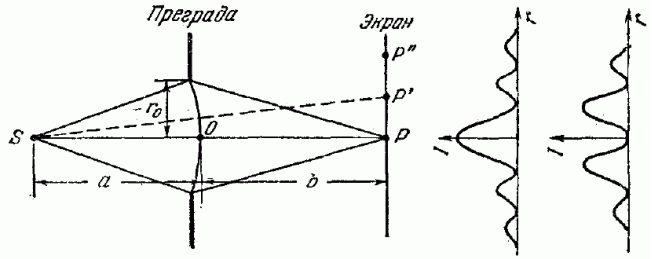
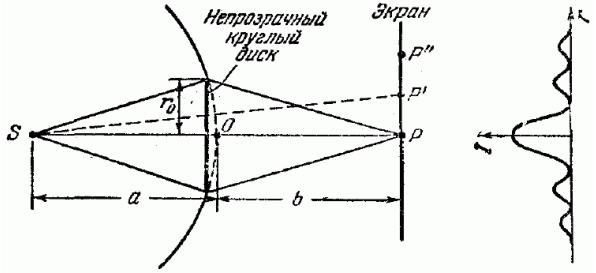
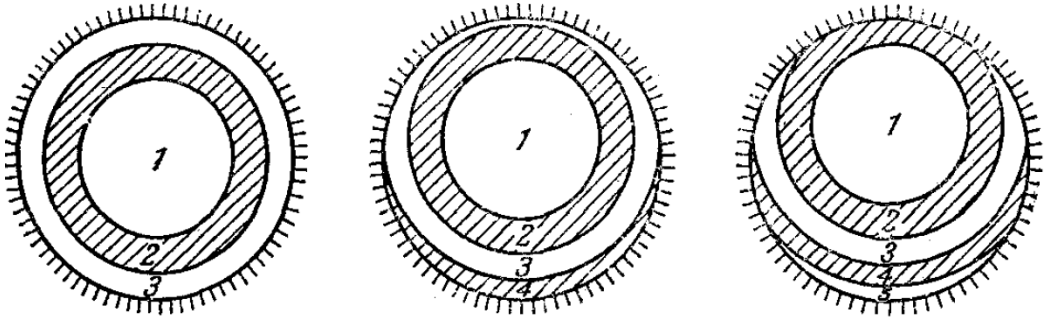
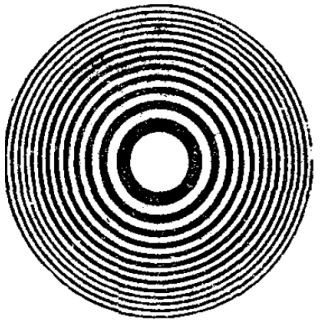


$$A = \frac{A_1}{2} \pm \frac{A_m}{2}$$

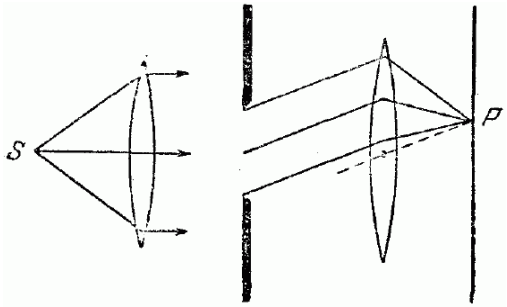


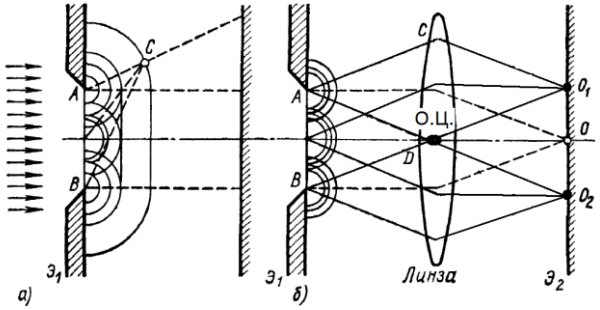
$$A = \frac{A_{m+1}}{2}$$

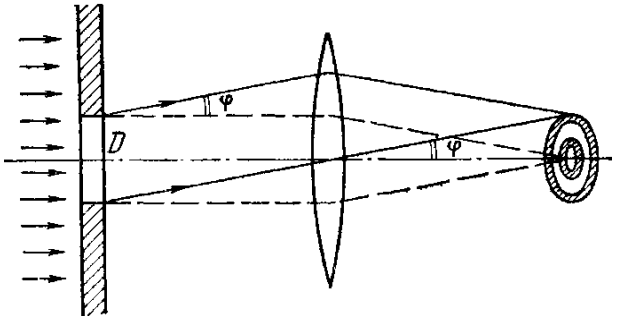




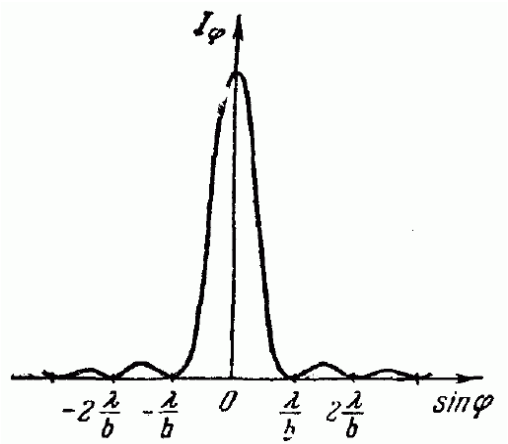
Дифракция Фраунгофера





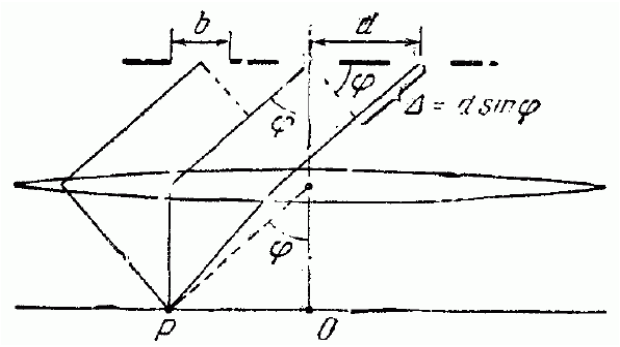


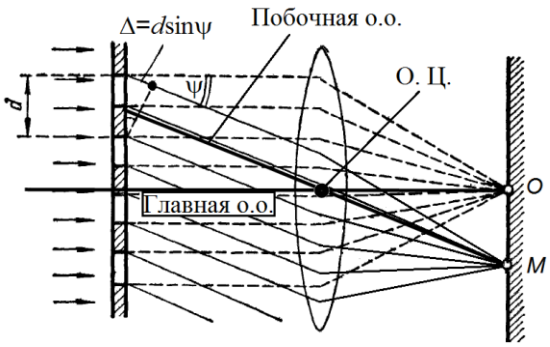
$$b \sin \varphi = \pm k\lambda \qquad (k = 1,\ 2,\ 3,\ \ldots)$$

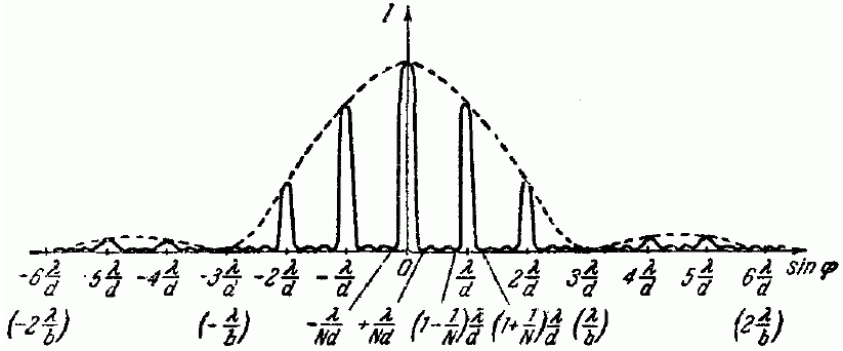


$$A_\varphi = \left| A_0 \frac{\sin\left[(\pi/\lambda)\, b \sin\varphi\right]}{(\pi/\lambda)\, b \sin\varphi} \right| \qquad I_\varphi = I_0 \frac{\sin^2\left[(\pi/\lambda)\, b \sin\varphi\right]}{\left[(\pi/\lambda) b \sin\varphi\right]^2}$$

Дифракционная решетка



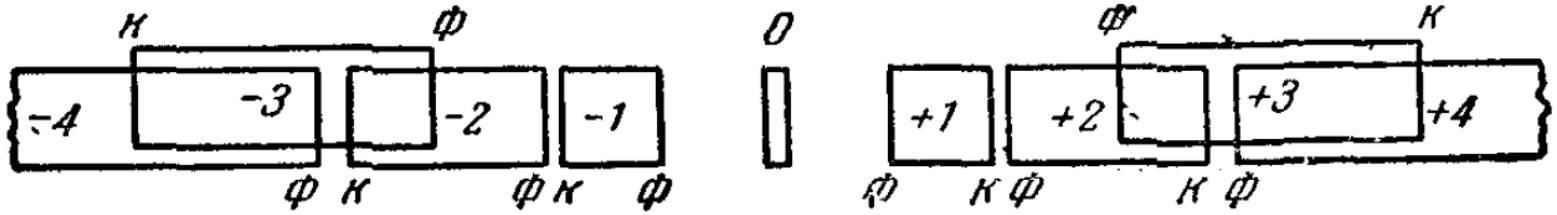




$$d\sin\varphi = \pm m\lambda \qquad (m = 0,\ 1,\ 2,\ \ldots)$$

$$d\sin\varphi = \pm \frac{k'}{N}\lambda \quad (k' = 1,\ 2,\ \ldots,\ N-1,\ N+1,\ \ldots,\ 2N-1,\ 2N+1,\ \ldots)$$

$$A_{\max} = NA_{\varphi} \qquad I_{\max} = N^2 I_{\varphi}$$

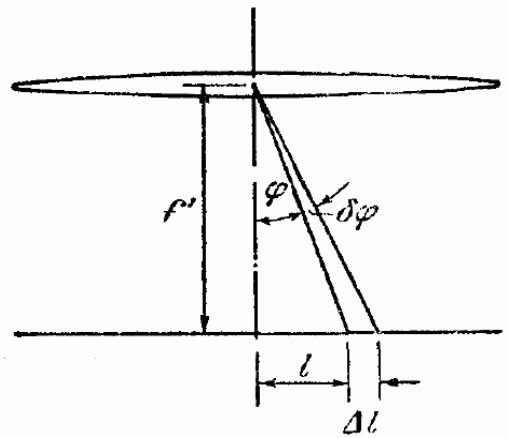


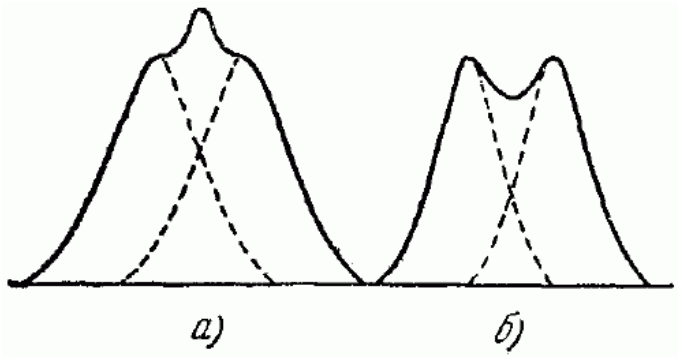
Угловая и линейная дисперсия

$$D = \frac{\delta\varphi}{\delta\lambda} = \frac{m}{d\cos\varphi}$$

$$D_{лин} = \frac{\delta l}{\delta\lambda}$$

$$D_{лин} = f' D$$





$$R = \frac{\lambda}{\delta\lambda}$$

$$R = mN$$