

D11FAGRANGS

Diffraction on an amplitude grating. Non normal incidence with angle ψ with respect to the normal.

Width of grating openings d , center to center distance of strips a ,
wavelength λ , distance from grating to screen X and coordinate on Screen Y .
All distances and wavelength in mm, number of lines N .

All parameters are globally defined above the graph.

$D(A)$ is the diffraction factor

$I(A)$ is the interference factor, normalized to 1. The numerator is plotted
separately to show where the main maxima are located (0/0).

$P(A)$ is the product of interference and diffraction factor.

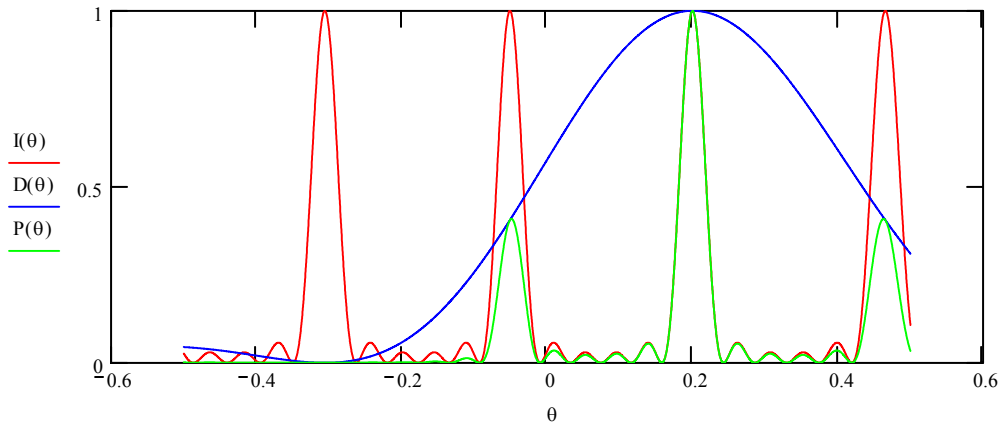
$$\theta := -.5001, -.4999.. .5$$

$$D(\theta) := \left[\frac{\sin \left[\pi \cdot \frac{d}{\lambda} \cdot (\sin(\theta) + \sin(\psi)) \right]}{\left[\pi \cdot \frac{d}{\lambda} \cdot (\sin(\theta) + \sin(\psi)) \right]} \right]^2$$

$$I(\theta) := \frac{\sin \left[\pi \cdot \frac{a}{\lambda} \cdot (\sin(\theta) + \sin(\psi)) \cdot N \right]}{N \cdot \sin \left[\pi \cdot \frac{a}{\lambda} \cdot (\sin(\theta) + \sin(\psi)) \right]}^2$$

$$P(\theta) := D(\theta) \cdot I(\theta)$$

$$d \equiv .001 \quad \lambda \equiv .0005 \quad a \equiv .002 \quad N \equiv 6 \quad \psi \equiv -.2$$



The angle ψ shifts the zeroth order from 0 for $\psi = 0$ to .2 for $\psi = -.2$