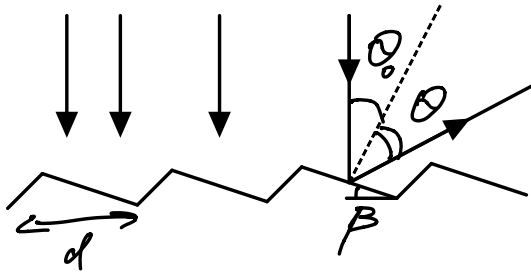


59.15



$$\alpha = \theta + \theta_0$$

$$d = 0,1 \text{ mm}$$

$$\beta = 0,05 \text{ rad}$$

$$\lambda = 500 \text{ nm}$$

$$u = \frac{\pi b}{\lambda} (\sin \theta - \sin \theta_0)$$

$$I_1 = I_0 \cdot \left(\frac{\sin u}{u} \right)^2 \text{ max when } u=0 \Rightarrow \theta = \theta_0 \Rightarrow \alpha = 2\theta$$

$$d \cdot (\sin \alpha - \sin \alpha_0) = n \lambda$$

$$d \sin \alpha = n \lambda$$

$$\alpha = 2\theta_0 = 2\beta$$

$$d \sin 2\beta = n \lambda$$

$$2d\beta \approx n \lambda \quad n = \frac{2d\beta}{\lambda} = \frac{0,1 \cdot 10^{-4}}{5 \cdot 10^{-8}} = \frac{100}{5} = 20$$