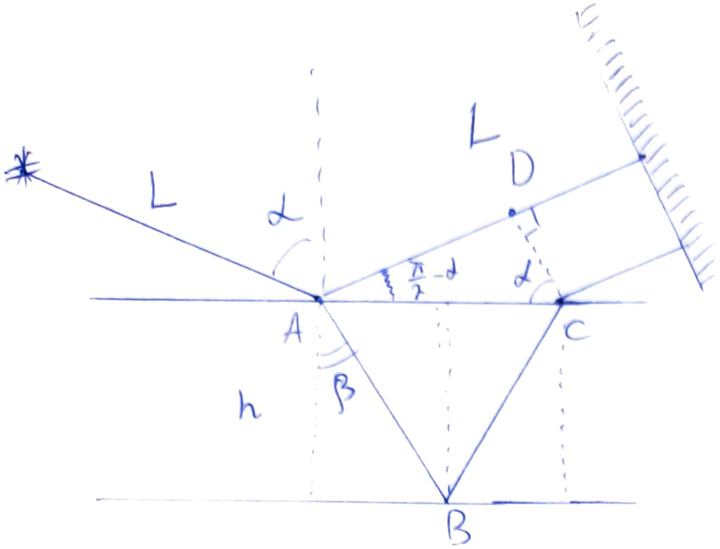


$h = 10^{-4}$ м

$\alpha = \frac{\pi}{3}$

$L = 1$ м

$n \cdot \sin\beta = \sin\alpha$

$\Delta\varphi = k_2(AB + BC) - k_1 \cdot AD + \pi \quad , \quad k_2 = n k_1$

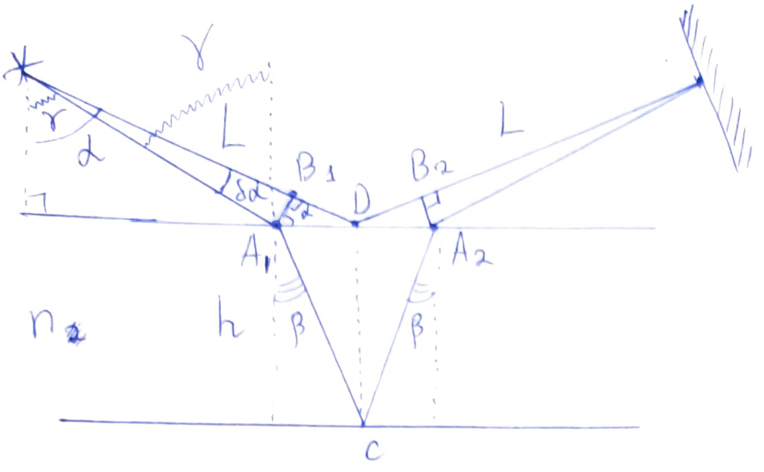
$AB = BC = \frac{h}{\cos\beta} \quad , \quad AD = AC \cdot \sin\alpha = 2h\,\mathrm{tg}\,\beta \cdot \sin\alpha$

$\Delta\varphi = n k_1 \cdot \frac{2h}{\cos\beta} - k_1 \cdot \frac{2h \sin\beta \sin\alpha}{\cos\beta} + \pi =$

$= \frac{2hnk_1}{\cos\beta}\left(1 - \sin^2\beta\right) + \frac{k_1\lambda}{2} = 2hnk_1 \cdot \cos\beta + k_1\frac{\lambda}{2}$

$n\cos\beta = \sqrt{n^2 - n^2\sin^2\beta} = \sqrt{n^2 - \sin^2\alpha} = 1,1$

$\Delta\varphi = \pi + \pi \cdot \frac{1}{\lambda} \cdot 4,4 \cdot 10^{-4}$ м



$\alpha = \frac{\pi}{3}$

$\gamma = \alpha - \delta\alpha$

$\sin\beta \cdot n = \sin\gamma \cdot 1$

$k_2 = n k_1$, т.к. $\frac{k_2}{k_1} = \frac{\lambda_1}{\lambda_2} = \frac{c_1}{c_2} = \frac{n}{1}$

$$\Delta\varphi = k_2 (A_1C + CA_2) - k_1 (B_1D + DB_2) + \frac{k_1\lambda}{2}$$

$$A_1C = CA_2 = \frac{h}{\cos\beta}$$

$$B_1D = DB_2 = h \cdot tg\,\beta \cdot \sin\alpha$$

$$\Delta\varphi = nk_1 \cdot \frac{2h}{\cos\beta} - k_1 \cdot 2h\, tg\,\beta \cdot \sin\alpha + \frac{k_1\lambda}{2} =$$

$$= \frac{2hk_1}{\cos\beta}\left(n - \sin\beta\sin\alpha\right) + \frac{k_1\lambda}{2}$$

$$L\sin\alpha - h\, tg\,\beta = L\cdot\cos\alpha\cdot tg\,\gamma$$

$$\frac{L}{\cos\gamma}\left(\sin\alpha\cos\gamma - \cos\alpha\sin\gamma\right) = h\, tg\,\beta$$

$$\frac{L}{\cos\gamma}\cdot\sin(\alpha-\gamma) = h\, tg\,\beta$$

$$\sin\delta\alpha = \frac{h\, tg\,\beta \cdot \cos\gamma}{L}$$

$$\cos\gamma \simeq \cos\alpha$$

$$tg\,\beta = \frac{\frac{1}{n}\sin\gamma}{\sqrt{1 - \frac{1}{n}\sin^2\gamma}} = \frac{\sin\gamma}{\sqrt{n^2 - \sin^2\gamma}}$$

$$tg\,\beta \simeq \frac{\sin\alpha}{\sqrt{n^2 - \sin^2\alpha}}$$

$$\Rightarrow \sin\delta\alpha \simeq \delta\alpha \simeq \frac{h}{L}\,\frac{\sin\alpha\cos\alpha}{\sqrt{n^2 - \sin^2\alpha}} =$$

$$= \frac{10^{-4}\,м}{1\,м}\cdot\frac{\frac{\sqrt{3}}{4}}{1,1} \simeq 4\cdot 10^{-5}$$