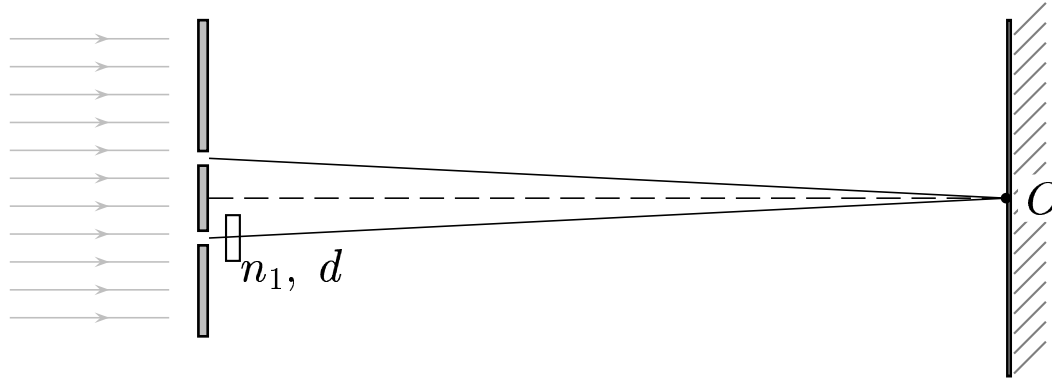


Consider the double slit setup. The lower slit is covered by a plastic with a thickness  $d = 2\mu$ , index of refraction  $n_1 = 1.5$ . The Incident wave has wavelength  $\lambda = 0.5\mu$ .



Find the phase angle  $\phi = |\phi_2 - \phi_1|$  at  $O$ .

- A)  $\phi = \pi$ .
- B)  $\phi = 2\pi$ .
- C)  $\phi = 3\pi$ .
- D)  $\phi = 4\pi$ .

$$\phi = \phi_{med} = k d (n_1 - 1).$$

$$\phi_{med} = \frac{2\pi}{\lambda} d (n_1 - 1) = \frac{2\pi}{0.5} \times 2 \times (1.5 - 1) = 4\pi.$$

Therefore,  $\phi = 4\pi$ .

Answer **D**.

37.04-03 Double Slits and Plastic sheet 2004-3-24