ASSIGNEMNT-1 SIGNALS AND SYSTEMS

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QUESTION:12.10':16

In double-slit experiment using light of wavelength 600 nm, the angular width of a fringe formed on a distant screen is 0.1Â°. What is the spacing between the two slits?

SOLUTION:

$$AngularFringewidth = \frac{(fringewidth)}{(Distance\,between\,the\,screen\,and\,slits}$$

$$Angular fringewidth = \frac{\beta}{D}$$

$$\beta = \frac{\lambda D}{d}$$

∵ given $\lambda = 600nm$
  $\theta = 0.1^{\cdot}$

$$\theta = \frac{\frac{\lambda D}{d}}{D}$$

$$d = \frac{\lambda}{\theta}$$

$$d = \frac{600 * 10^{-9}}{\frac{0.1\pi}{180}}$$

$$\therefore d = 3.44 * 10^{-4}m$$