

$$1. \quad \lambda = 514.5 \text{ nm}$$

$$y = 4.55 \text{ mm}$$

$$L = 3.25 \text{ m}$$

$$\theta = \frac{y}{L} = \frac{.00455}{3.25} = .0014 \text{ radians} = .0802^\circ$$

angular separation

$$y = \frac{n\lambda L}{d} \quad d = \frac{n\lambda L}{y} \quad d = \frac{(1)(514.5 \times 10^{-9})(3.25)}{(.00455)}$$

$$y = .00036 \text{ m} = .36 \text{ mm} \quad \text{distance between slits}$$

$$d \sin \theta = 1.22 \lambda \quad d \frac{y}{L} = 1.22 \lambda$$

$$L = \frac{dy}{1.22 \lambda} = \frac{(2 * .00289)(.00455)}{(1.22)(514.5 \times 10^{-9})} = \underline{\underline{41.9 \text{ m}}}$$