

18. Using the notation of Sample Problem 37-6 (which is in the textbook supplement), the maximum distance is

$$L = \frac{D}{\theta_R} = \frac{D}{1.22\lambda/d} = \frac{(5.0 \times 10^{-3} \text{ m})(4.0 \times 10^{-3} \text{ m})}{1.22(550 \times 10^{-9} \text{ m})} = 30 \text{ m} .$$