

Solution



Halley's
Comet

1. Assuming diffraction-limited optics, what is the minimum angular separation of two stars that can be resolved by a $D = 5 \text{ m}$ telescope using light of $\lambda = 500 \text{ nm}$?

a. $0.1 \mu\text{rad}$

b. $1 \mu\text{rad}$

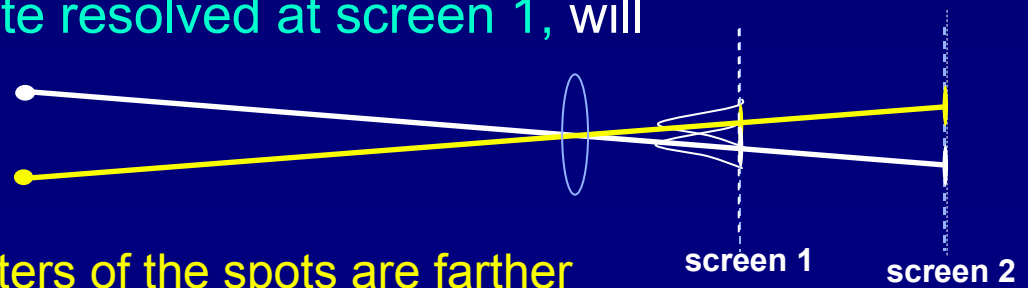
c. $10 \mu\text{rad}$

$$\alpha_c = 1.22 \frac{\lambda}{D} \approx 1 \times 10^{-7} = 0.1 \mu\text{rad}$$

2. If the two point sources are not quite resolved at screen 1, will they be resolved at screen 2?

a. Yes

b. No



α_c only depends on λ and D . The centers of the spots are farther apart, but the spots are also wider by the same amount.