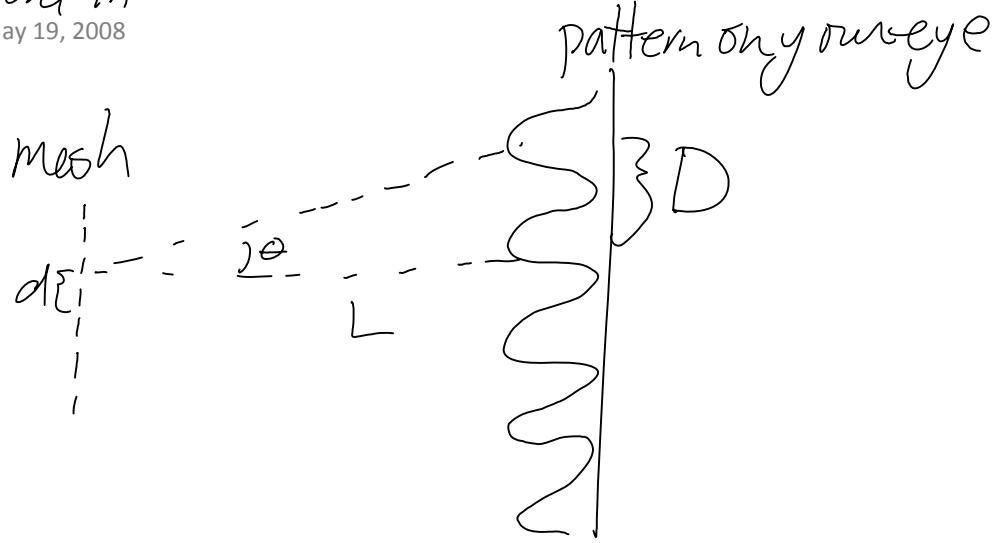
Crawford 9.9

Monday, May 19, 2008
11:06 AM



In the small angle approx.

$$\theta \approx \frac{D}{L}$$

Peaks of the interference pattern occurs when $\theta = \frac{\lambda}{d}$

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

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

you may see that the fringes in the pattern is ~ 0.2 cm apart.
use $\lambda = 500$ nm. L is about 20 cm.

$$d = \frac{500 \times 10^{-7}\ \text{cm} \cdot 20\ \text{cm}}{0.2\ \text{cm}}$$

$= 0.005\,cm$

$= 50$ micrometer [μm]

Crawford 9.16

Monday, May 19, 2008
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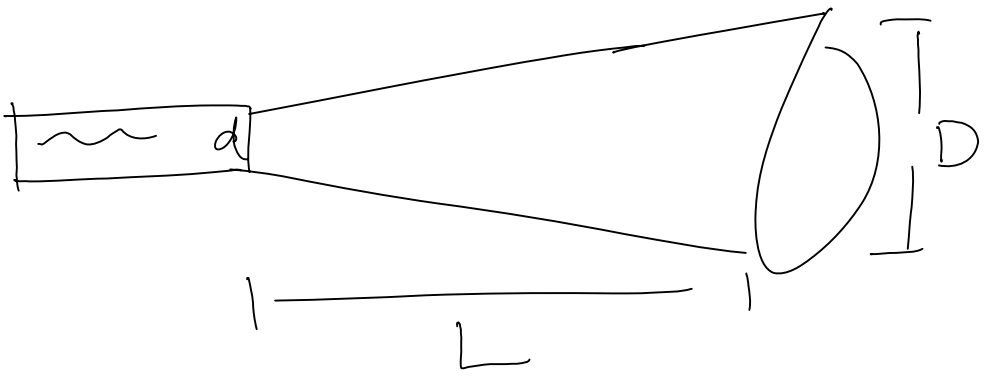
diffraction-limited mean the light only spread by diffraction out of the Laser



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

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

$$= \frac{2.4\times10^{5}\ \text{mi}\ \ 6.30\times10^{-5}\ \text{cm}}{1\ \text{cm}}$$

$$= 15\ \text{miles}$$

$$= 24\ \text{km}$$