

Two-Slit Interference, small angles:

Often, $d \gg \lambda$, so that θ is small.

Then we can use the **small angle approximation** to simplify our results:

For small angles: ($\theta \ll 1$ radian):

$\sin\theta \approx \theta \approx \tan\theta$ (only in radians!)

$$y = L \tan\theta \approx L\theta$$

Constructive interference:

$$\theta \approx m(\lambda/d)$$

$$y \approx m(\lambda/d)L$$

$$m = 0, \pm 1, \pm 2, \dots$$

Destructive interference:

$$\theta \approx (m + \frac{1}{2})(\lambda/d)$$

$$y \approx (m + \frac{1}{2})(\lambda/d)L$$

$$m = 0, \pm 1, \pm 2, \dots$$

