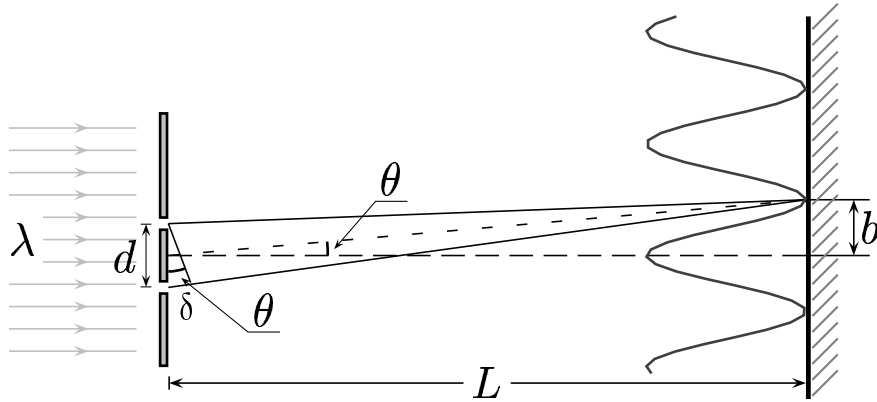


Consider the double slit experiment setup with two incident waves.

A: $\lambda_A = 400$ nm, and 1st minimum occurs at $y = b_A$.

B: $\lambda_B = 600$ nm, and 1st minimum occurs at $y = b_B$.



In the small angle approximation, determine the ratio $\frac{b_B}{b_A}$.

- A) $\frac{b_B}{b_A} = 1.5$.
- B) $\frac{b_B}{b_A} = 1$.
- C) $\frac{b_B}{b_A} = .67$.

The first minimum occurs at phase angle difference:

$$\phi = k \delta = \pi.$$

Therefore, $\delta = \frac{\lambda}{2}$.

$$\theta \approx \frac{\delta}{d} \approx \frac{b}{L}.$$

With $\delta = \frac{\lambda}{2}$,

$$b = \frac{\delta L}{d} = \frac{\lambda L}{2d}.$$

$$\text{So } \frac{b_B}{b_A} = \frac{\lambda_B}{\lambda_A} = \frac{600}{400} = 1.5.$$

Answer **A**.

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