

64. For the n th harmonic of the standing wave of wavelength λ in the cavity of width L we have $n\lambda = 2L$, so $n\Delta\lambda + \lambda\Delta n = 0$. Let $\Delta n = \pm 1$ and use $\lambda = 2L/n$ to obtain

$$|\Delta\lambda| = \frac{\lambda|\Delta n|}{n} = \frac{\lambda}{n} = \lambda \left(\frac{\lambda}{2L} \right) = \frac{(533 \text{ nm})^2}{2(8.0 \times 10^7 \text{ nm})} = 1.8 \times 10^{-12} \text{ m} = 1.8 \text{ pm} .$$