

Expt. 8: Resonance on a String

Read Experiment #8 and find the equation that theoretically describes the relationship between the velocity, frequency and wavelength of a wave traveling on a string.

Think about how you will graph your experimental data and extract information from it. Answer the following questions:

What will be plotted on the y-axis?

What will be plotted on the x-axis?

What does the equation predict the algebraic expression for the slope will be?

What does the equation predict the algebraic expression for the y-intercept will be?

The average internodal distance of a vibrating string is 22.1 ± 0.2 cm. Find the inverse wavelength, $\frac{1}{\lambda}$, in SI units.

(Unrounded answer: 2.262 ± 0.020)

A string has a linear density of $\mu = (5.20 \pm 0.02) \times 10^{-3}$ kg/m. Tension in the string is supplied by a hanging mass of $m = 75.0 \pm 0.5$ g. The acceleration due to gravity is $g = 9.81 \pm 0$ m/s². Find the speed of the wave on this string.

(Unrounded answer: 11.895 ± 0.063)

Note: You will not be allowed into the lab until you show that you have done the prelab and have properly prepared the introductory portion (Title, Objective, Theory Summary and Uncertainty Derivations) of the lab in your notebook.

No extra lab time will be allowed for the time you miss if you are unprepared.