PHY 210L FINAL 2015

1. Standing waves:

LINEAR REGRESSION:

F=$\frac{n}{2L}\sqrt{\frac{mg}{μ}}$
you have table containing values of F and M.

a) Find a relation between them

b) Find the slope along with its error

c) Find the linear density (using the slope calculated previously) along with its error (propagation of error).

2) Bernoulli Experiment:
a) describe an experiment that can help us determine the drag coefficient.

F = Cw.V2.A.ρ/2

(We find F which is equal to mg (the system is in equilibrium at a given speed of fan speed)

then we calculate the speed V2 using a precision manometer and Fan set . The latter will help us calculate the pressure P . Using Bernoulli equation , we plug in the value for the pressure and we find $V^{2}$. The area is calculated by measuring the diameter using vernier caliper and from it , we calculate the radius. Then we find the cross sectional area of the ball using A=2π$r^{2}$. (ρ=1.3)
Finally we plug in the values to find Cw=$\frac{F}{V^{2}.A.ρ/2}$.
b) What is Manometer and what is used for??

3) Spectrometer:

a) Define a prism:

b) Define a diffraction grating??

c) Explain the difference in the spectrum when using the diffraction grating and using the prism

d) you have learned in the PHY210 lab the spectrum of both incandescent lamp and hydrogen source, indicate the type of the spectrum of each source??
 ---incandescent lamp: emission spectrum
--- hydrogen source: absorption spectrum

4) Sound waves in air column:

You have a table containing the positions where there is antinodes in sound waves

|  |  |  |  |
| --- | --- | --- | --- |
| Position | distance |  |  |
| 1 | Value1 |  |  |
| 2 | Value2 |  |  |
| 3 | Value3 |  |  |
| 4 | Value4 |  |  |
| 5 | Value5 |  |  |

1. Calculate the average wavelength along with its error(You have to use the formula $λ$=$\frac{4L}{n}$)
2. Calculate the speed of air along with its error(propagation of error)(in this exercise, you are given the frequency)
3. Explain what a thermistor is and how it was used in the linear expansion experiment??

(You have the full explanation in the slides)

Good Luck