Experiment 11: Standing Waves in a String **7/13/2022**

Student Name: **Luke Le**

Section Number: **51002**

REPORT

Instructions

1) Follow all of the lab activity steps given in the Lab Procedure.
2) Attach your ***completed*** data tables and graphs to this page.
3) TYPE YOUR ANSWERS IN THE PROVIDED SPACES below & in your data tables.
4) Attach additional sheets of paper that clearly (NEATLY) show all of your calculations performed during this experiment.

Results

1) With the settings used in the simulation, you were unable to produce the 1st harmonic in either Part A or Part B. Why not? What ***specific*** changes to the simulation settings would enable you to see the 1st harmonic in each part? Write out your answer in a clear and well supported paragraph.

> In part A, the 1st harmonic could not be produced in the simulation because it did not have the necessary range of values to produce the 1st harmonic. The first harmonic would require about 3300 N of tension, which realistically would not be something that would be easily produced. However, decreasing the frequency would allow for the 1st harmonic. In part B, the frequency is too low for the harmonic to be produced. Decreasing the length of the string would be a reasonable solution to produce the harmonic.

2) Based on your experimental results, how does the number of segments in a standing wave vary with the tension in the string when the frequency is constant? How well do your measurements match the theoretical relationship between number of segments and string tension? Write out your answer in a clear and well supported paragraph.

> The tension appears to be inversely proportional to the number of segments in a standing wave. The resulting measurement appears to be largely accurate to the theoretical relationship as suggested by the notably low percentage error.

3) Is the speed of the wave constant in Parts A and B? How did you determine this for each part? If the speed is not constant, how does it change as a function of harmonic number? Write out your answer in a clear and well supported paragraph.

> The speed of the wave in a string is represented by the equation v=sqrt(F/mu), and it is from the equation that it may be determined that speed is constant in part B while not constant in part A. The speed changes as a result of the equation, that takes note of this natural rule, v=(2Lf)/n.