Harmonic motion-elastic spring - lab report example

Science, Physics

Harmonic Motion-Elastic spring

Harmonic Motion-Elastic Spring Lab Report This experiment’s aim was to provide verification into the dependence period on the mass of the oscillator. To be able to achieve this goal, the researcher conducted 10 experiments with each experiment entailing the hanging of a different mass on the spring. The mass used in the experiments was changed in a subsequent manner through the addition of 10 grams weight to the initial 100 grams weight of mass. Consequently, the study was in 5 runs with each run lasting about 10 oscillations. The analysis of the data involved the drawing of scatter plots with the oscillating mass used as the independent variable while the time as the dependent variable. The plot resulted in a straight line that was used to determine the elastic constant of the spring and its accuracy based on the slope.

Introduction

The study of a harmonic motion of a mass suspended on an elastic spring is as a result of an additional displacement of magnitude that occurs when additional mass is added onto the spring.

In this harmonic motion experiment, the spring oscillated up and down with amplitude and a time period measured as t. The theory underlying the phenomenon being studied here was that of Hooke’s law for an elastic spring (Wilson & Hall, 2009). In setting up the experiment, a spring, set of weights, a stand and timing mechanism were used. In releasing the weights, and starting the oscillations, an electromagnet was used. The procedure was to connect the weight to the spring and power the electromagnetic with the metal weight sticking to the electromagnet, and when the button is released,

oscillations started.

Statement of conclusion

The hypothesis was that there is a dependence period in the mass of the oscillator. This is proven given that, with the addition of extra mass, the time increased from 8 in the first experiment to 12 in the last experiment. Averagely the time increase from 0. 76 to 1. 2 in the last experiment. This proves the null hypothesis that time period is dependent on the mass of oscillator.

Reference

Wilson, J. D., & Hall, C. A. H. (2009). Physics laboratory experiments. Boston, MA: Brooks/Cole, Cengage Learning.