



Classical Mechanics
Lab 6
The Simple Pendulum
Week 7

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Overview

- Equipment
- Procedure for gathering data
- Data analysis

Purpose of the Lab

To investigate the behavior of a simple pendulum and gain familiarity with oscillations and simple harmonic motion.

You will explore the effect of changing the length, ℓ , of the pendulum string on the time period of the oscillation, T .

You will also investigate the effect of changing the mass, and the amplitude of the swing.

Theory

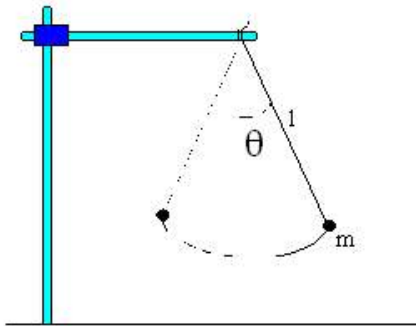
You will need to derive an expression relating T to ℓ .

Fortunately, you have just seen how to do that.

Write up the derivation neatly and clearly in your lab book.

Pendulum Arrangement

You will suspend a mass on a long string from a pair of rods.



The vertical rod should slot into one of the metal holes on your lab bench. Join the rods with an angle clamp.

Pendulum Arrangement



Pendulum Arrangement



Analysis

You will plot two graphs using a computer:

- 1 Period, T , on the vertical axis, versus Length, ℓ on the horizontal axis. Should yield a square root, non-linear curve.
- 2 plot the same data with different axes. Choose axes that give a straight line whose slope is equal to g

Compare the slope of the second graph to g .

Analysis

Experiment a little bit with changing the amplitude of the swing and the mass on of the bob.

What effect does that have?

