Phys3201 Template GT

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Abstract

In this experiment we studied pendulum motion in a non-uniformly accelerating reference frame. **Special notes:** Prof Goldman specifically requested to not have "100" sig figs, put font on figure axes in readable size, and don't put grids on plots!

1 Introduction

Motivate why you chose the problem that you did. Why is it interesting?

2 Background

Give a brief summary of the physical theory, include any equations necessary, and cite any references you want to include. Here is how you insert an equation. According to references [?, ?, ?] the dependence of interest is given by

$$\mathcal{L} = \frac{1}{2}m\ell^2(\dot{\theta} + \dot{\phi}_0)^2 - mg_e(t)\ell\cos(\theta)$$

$$m\ell^2(\ddot{\theta} + \ddot{\phi}_0) = mg_e\ell\sin(\theta)$$

$$\ddot{\phi}(t) = -\frac{g_e(t)}{\ell}\sin\left(\phi(t) - \phi_0(t)\right) \tag{1}$$

3 Methods

Give a schematic of the experimental setup(s) used in the experiment (see figure **??**). Give the description of abbreviations either in the figure caption or in the text. Write a description of what is going on.

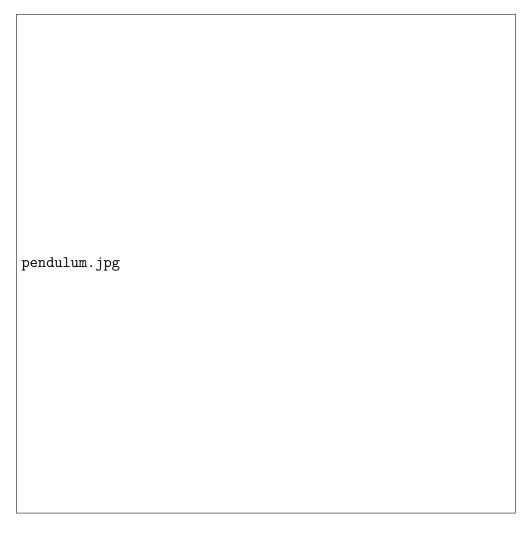and eventually arrived to the balanced photodiode as seen in the figure **??**.

Figure 1: Pendulum that starts at rest in an accelerating frame. If the acceleration is not constant then the apparent vertical, and thus ϕ_0 will change with time

4 Results

In this section you will need to show your experimental results. Use tables and graphs when it is possible. Table **??** is an example.

Analysis of equation **??** shows ...

For example, it is easy to conclude that the experiment and theory match each other rather well if you look at Fig. **??** and Fig. **??**.

5 Conclusions

Here you briefly summarize your findings. Did you learn any new physics? Was everything as expected?

Table 1: Every table needs a caption.

x (m)	V (V)
0.0044151	0.0030871
0.0021633	0.0021343
0.0003600	0.0018642
0.0023831	0.0013287

6   Future Work

Since you had limited time to work on this project, what questions are left outstanding? What would be your next steps?

References

[1] A. C. Melissinos and J. Napolitano, *Experiments in Modern Physics*, (Academic Press, New York, 2003).

[2] N. Cyr, M. Têtu, and M. Breton, IEEE Trans. Instrum. Meas. **42**, 640 (1993).

[3] *Expected value*, available at `http://en.wikipedia.org/wiki/Expected_value`.