Acceleration Due to Gravity

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1 Introduction

It is well known that if the effects of air resistance are ignored, any object dropped in the vicinity of Earth's surface will move with constant acceleration $\vec{g}$. The direction of $\vec{g}$ is down, towards Earth's center and it's magnitude is approximately $9.8\ m/s^2$. The motion of freely falling objects is one dimensional motion with constant acceleration. In general,

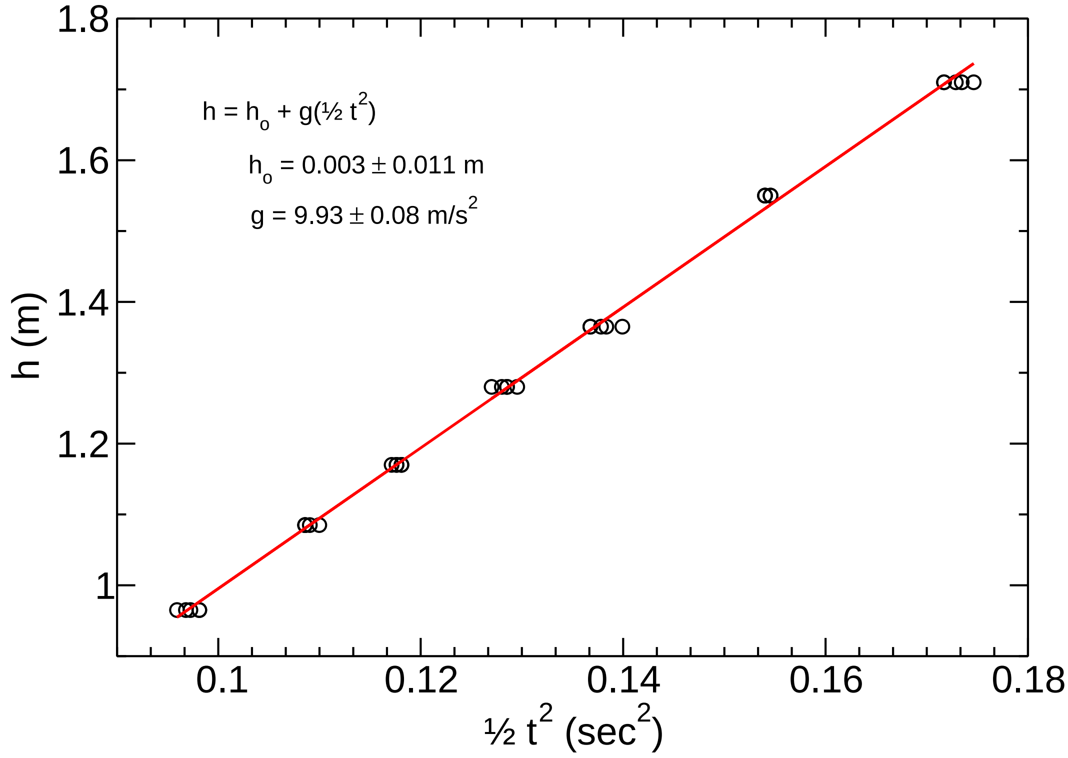

Figure 1: Free fall height h vs. $\frac{1}{2}t^2$. The slope of the graph is acceleration due to gravity.

3 Results and Discussion

Inspection of equation (2) shows that the free fall distance, h, depends linearly on the $\frac{1}{2}t^2$. The slope of this line is acceleration due to gravity. In Figure 1 we plot all the data in this way along with the best linear fit to the data. The slope is determined to be $g = 9.93 \pm 0.08 \text{m/s}^2$ while the intercept is $h_o = 0.003 \pm 0.011\text{m}$. The value of the intercept is an indicator of the presence of systematic errors

h(cm)	Δt (sec)
136.5	0.529
	0.525
	0.523

1. put spring in for release
2. compress as far as possible