

# Lab Report: Length, Velocity and Acceleration

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TABLE I. Length of rods

Ruler, a [cm]	Ruler, b [cm]	Laser, a [cm]	Laser, b [cm]
119.50	119.60	120.50	120.60
119.50	119.70	119.60	119.80
119.45	119.60	119.50	119.70
119.40	119.50	119.40	119.60
119.43	119.55	119.40	119.60
119.40	119.60	119.68	119.72
119.40	119.50	119.90	119.70
119.45	119.65	130.60	130.20
119.40	119.60	119.40	119.50
119.43	119.55		

TABLE II. Uncertainty in Length measurement

	$x$	$\delta x$
$l_a$	119.5cm	
$l_b$	119.6cm	
$dl_s$		1.4mm
$\sqrt{n} \cdot dl_i$		$0.5\sqrt{5}mm$
$dl_m$		1.4mm
$\alpha l_a(T - 25C)$	-0.156cm	$\sim 10^{-6}$
	$\sum x$	$\sum \sigma x_i^2$
$\sum l_a$	119.48cm	2.27
$\sum l_b$	119.58cm	2.27

## I. INTRODUCTION

## II. THEORY

$$T \approx 2\pi \sqrt{\frac{L}{g}} \quad (1)$$

Where  $T$  denotes the period of a pendulum,  $L$  its length and  $g$  the gravitational acceleration. The small angle approximation (Eqn. 1) is valid for angles  $\theta \ll 1$  rad with an error  $\approx \pm 15$  s per day [1].

## III. EXPERIMENTAL PROCEDURE

## IV. RESULTS

## V. DISCUSSION

## VI. CONCLUSION

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[1] <https://en.wikipedia.org/wiki/Pendulum>.

TABLE III. Period of pendulum

$T$ [s]
7.30
7.72
7.57
7.43
7.73
7.27
7.68
7.60
7.34
7.75
7.06
7.32
7.55
7.29
7.08
7.82
7.78
7.44
7.68
7.46