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PHY350 Lab Report
Practical: 9 Registration No.: 11912610 Section: G2903

Aim

To measure high resistance using leakage method

Results & Conclusions

We obtained an estimate of R by finding an average slope to the data points (see Figure 1). The slope of $\log_{10}\left(\frac{\theta_0}{\theta_t}\right)$ vs time plot is found using least squares fitting.

The resistance we obtained was $R \sim 8.14 \times 10^6 \Omega$, which corresponds to a percentage error of -1.85% from the true value.

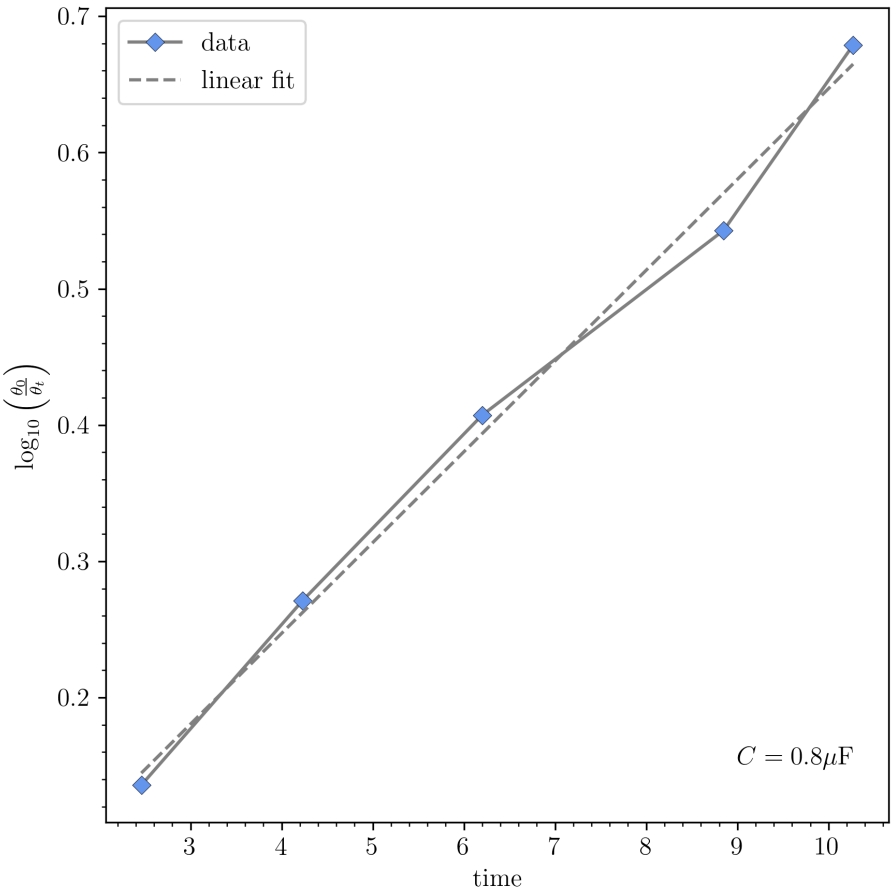

Figure 1: The straight line fit done using a least squares regression is shown with a dashed line.

Due to the relation

$$\log_{10}\left(\frac{\theta_0}{\theta_t}\right) = \frac{t}{2.303RC}$$

the slope is related to the resistance as

$$R = \frac{1}{2.303mC}$$

The measurements for the output characteristics have been summarized in Table 1.

θ_0	Discharging time	θ_t	θ_0/θ_t	$\log_{10}\theta_0/\theta_t$
20	2.46	14.63	1.37	0.14
20	4.23	10.71	1.87	0.27
20	6.2	7.83	2.55	0.40
20	8.85	5.73	3.49	0.54
20	10.27	4.19	4.77	0.68

Table 1: Measurements