

Intermediate Laboratory: Homework 2

Due: 30 January 2019

Read chapter 3 and complete the following problems.

- 1 Taylor, *Error Analysis*, 3.2, page 79.
- 2 Taylor, *Error Analysis*, 3.5, page 80.
- 3 Taylor, *Error Analysis*, 3.19, page 82.
- 4 Taylor, *Error Analysis*, 3.23, page 83.
- 5 Taylor, *Error Analysis*, 3.28, page 85.

6 Parallel resistors

The effective resistance of two resistors in parallel is given via

$$\frac{1}{R_{\text{eff}}} = \frac{1}{R_1} + \frac{1}{R_2}$$

where R_1 and R_2 are the resistances of the two resistors. Suppose that you are given two resistors whose stated resistances are $220\ \Omega \pm 5\%$ and $100\ \Omega \pm 8\%$. The aim of this exercise will be to compute that effective resistance of the combination plus its uncertainty.

- a) Rearrange the rule for effective resistance to give

$$R_{\text{eff}} = \text{formula involving } R_1 \text{ and } R_2.$$

- b) Determine the effective resistance of the combination and the error in this. Use these to state the effective resistance of the combination completely.