SCHOOL OF ENGINEERING

FINAL REPORT

NUMERICAL ANALYSIS OF THE ERROR IN EXPERIMENTAL DATA AND APPLICATIONS ON THERMOCOUPLE READINGS

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ABSTRACT

Experiments usually will never produce the results exactly same of the obtained theoretical calculations. There are various reasons for not obtaining the ideal values while conducting the experiments due to instruments, human error. Precision and accuracy is vital in an experiment, such that proper and concise observation on the experimental data is needed to check the instruments reliability, this is called Error Analysis [5]. This project addresses the error in the data obtained from thermocouple used in solar water heater. The experimental data used is from actual systems tested at the solar park in Universiti Kebangsaan Malaysia.

Analysis on the obtained experimental data is very important to determine the reliability of the results in relation to the accuracy and precision of the experiment. Calibration of the thermocouple is seen as a factor of error as its value does not match the true value, this is seen as thermocouple is extremely sensitive equipment. The conversion is done from milivolts to Celsius, different solar intensities and weather condition is used to analyze. This project describes the numerical methods suitability on the experimental data, statistics and software to generate the analysis easier and faster.