

## Construction of $\text{Cu}_2\text{O}$ Thin Film Based Light Detector

K.D.R.N. Kalubowila<sup>1</sup>, K.M.D.C. Jayathileka<sup>2</sup>, W. Siripala<sup>2</sup> and J.K.D.S. Jayanetti<sup>1</sup>

<sup>1</sup>*Department of Physics, University of Colombo, Colombo*

<sup>2</sup>*Department of Physics, University of Kelaniya, Kelaniya*

### ABSTRACT

The purpose of this study was a construction of a practically useful low cost device to measure and display the light intensity by using photo sensitive  $\text{Cu}_2\text{O}$  thin films and to study the effects of light on these films. In this study, a  $\text{Cu}_2\text{O}$  thin film is used as the light sensor of the device. These photosensitive films could be used in different forms for this task. Light can be monitored either using a single n-type / p-type thin film or in the form of a hetero-junction. It was found that a  $\text{Cu}_2\text{O}/\text{Cu}_2\text{S}$  hetero-junction produced better photo-voltaic properties. This study reports the performance of a  $\text{Cu}_2\text{O}/\text{Cu}_2\text{S}$  hetero-junction as a light detector. The detected signal was converted into an output voltage that could be amplified to detect light of very low intensities. For A-D conversion and the display of intensity measurements, a PIC Microcontroller was used. The device demonstrated its ability to measure the light intensity of the environment with intensities as low as 1 lux. It is highly cost effective compared to the commercially available light detectors.