



Building a Muon Detector

06-09-2018

João Fernando Marques da Silva
Manuel José Dias Cerqueira da Silva
Maria Ana de Matos Afonso Pereira

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Muons

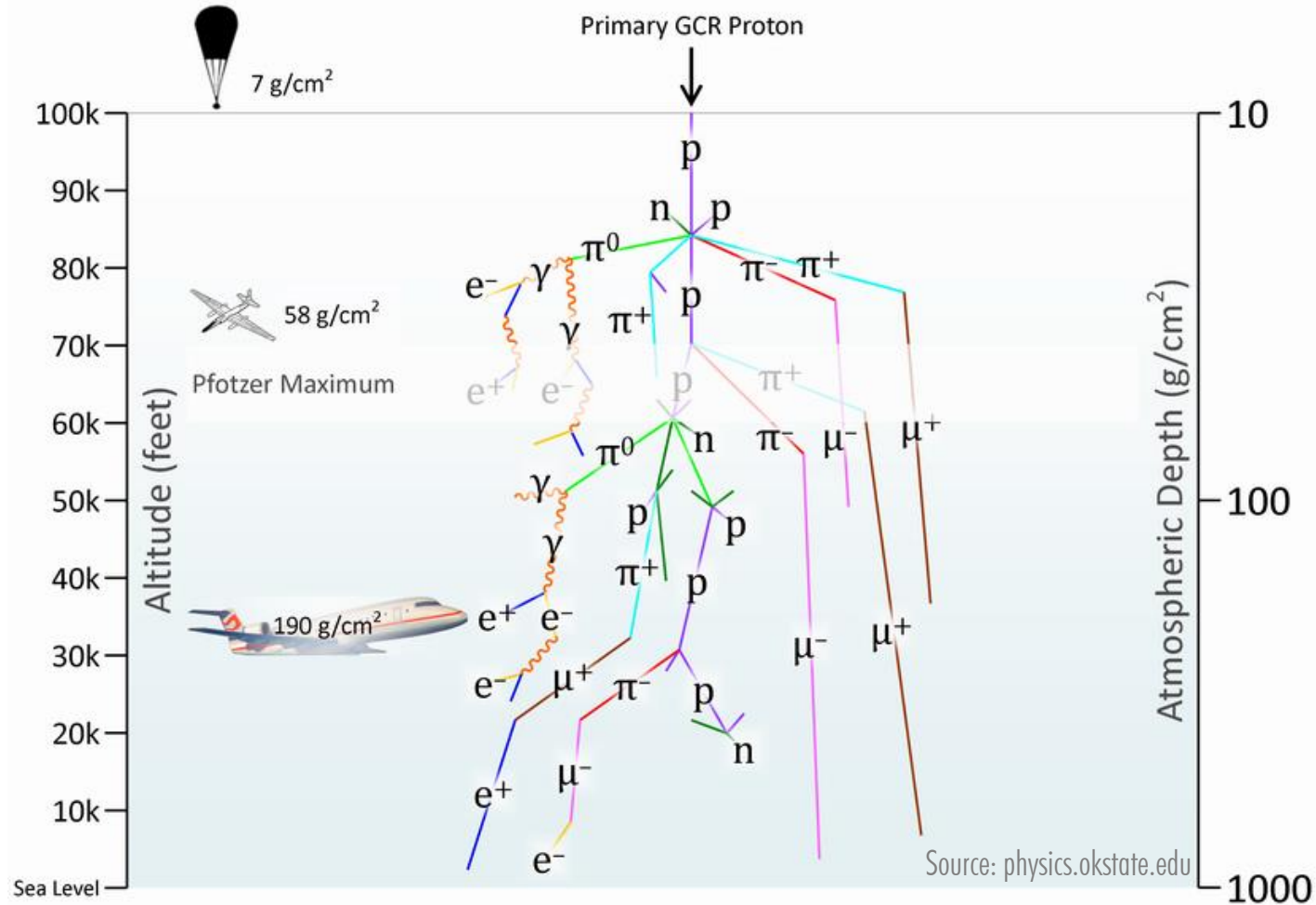


Figure 1 Air shower illustration depicting hadronic, electromagnetic, and muonic components. Muons are labeled with the symbol μ .

The Detector

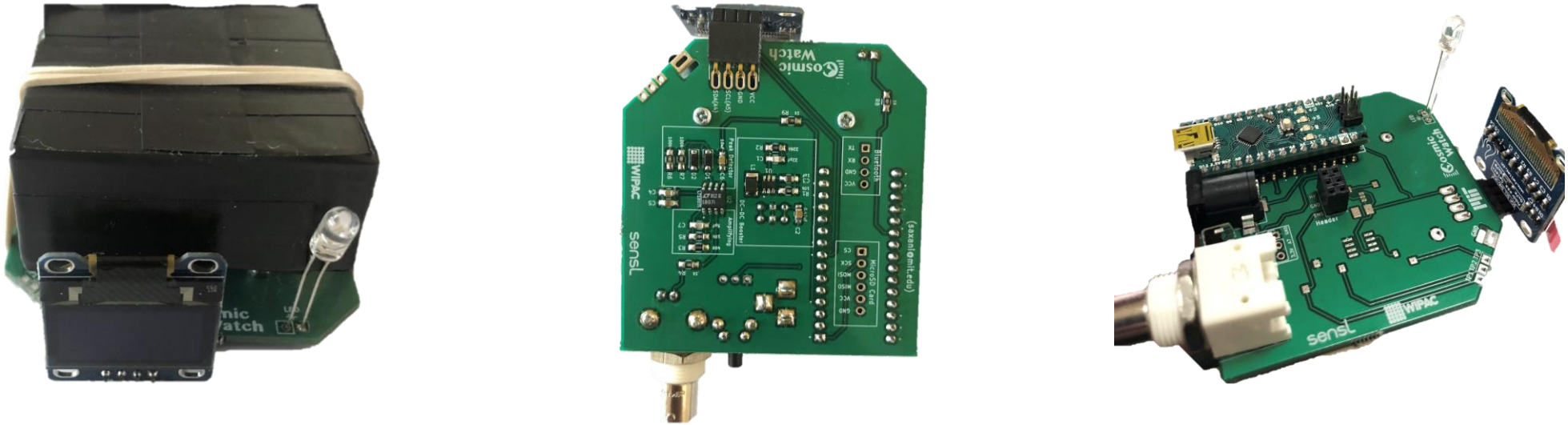


Figure 2 Pictures of the detector. Front, bottom and top view.

Source: cosmicwatch.lns.mit.edu/

How it works

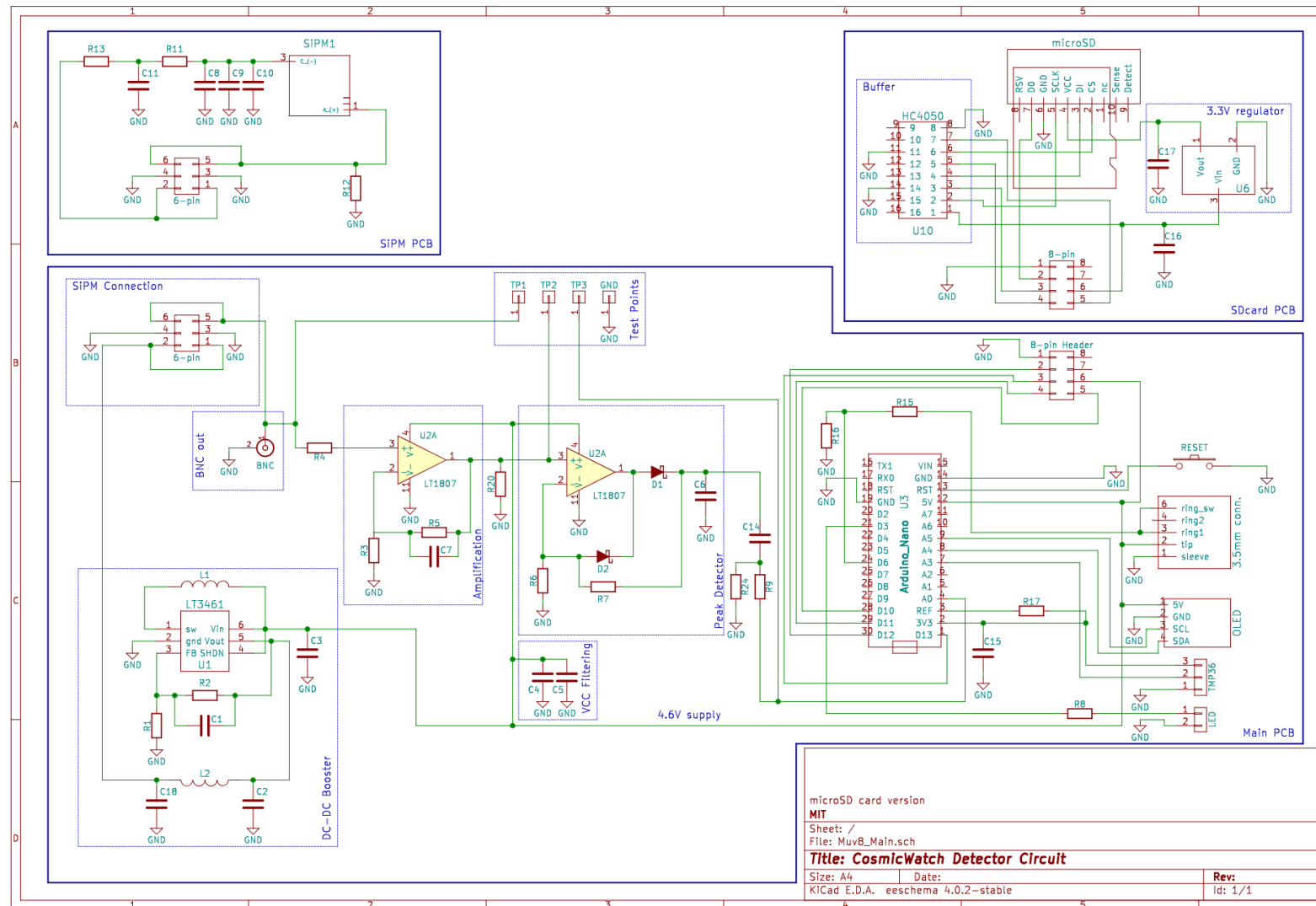
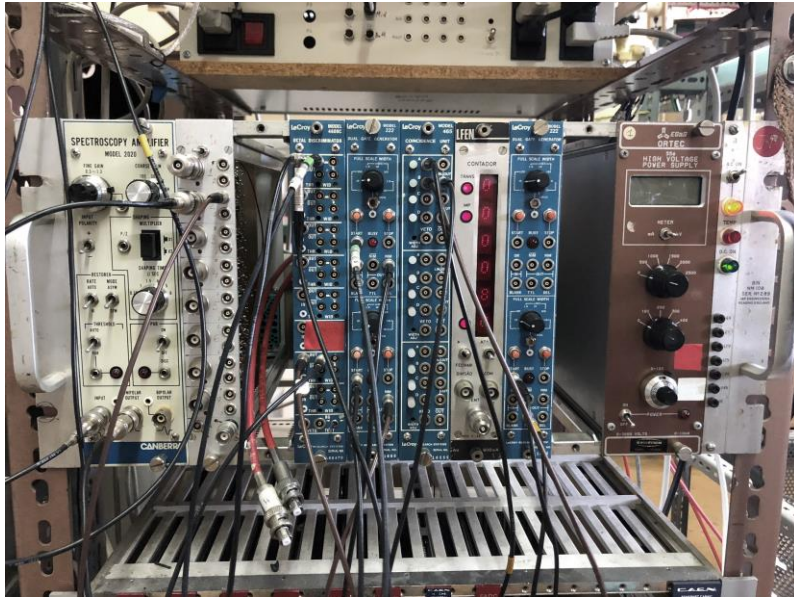
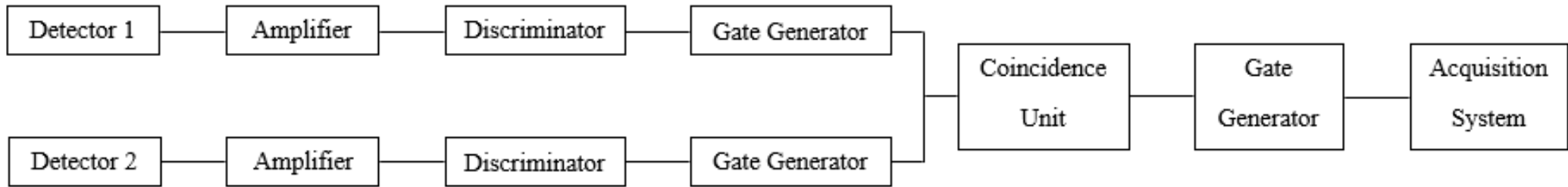


Figure 3 Detector electric circuit

Source: cosmicwatch.lns.mit.edu/

Hardware Coincidences



Hardware Coincidences

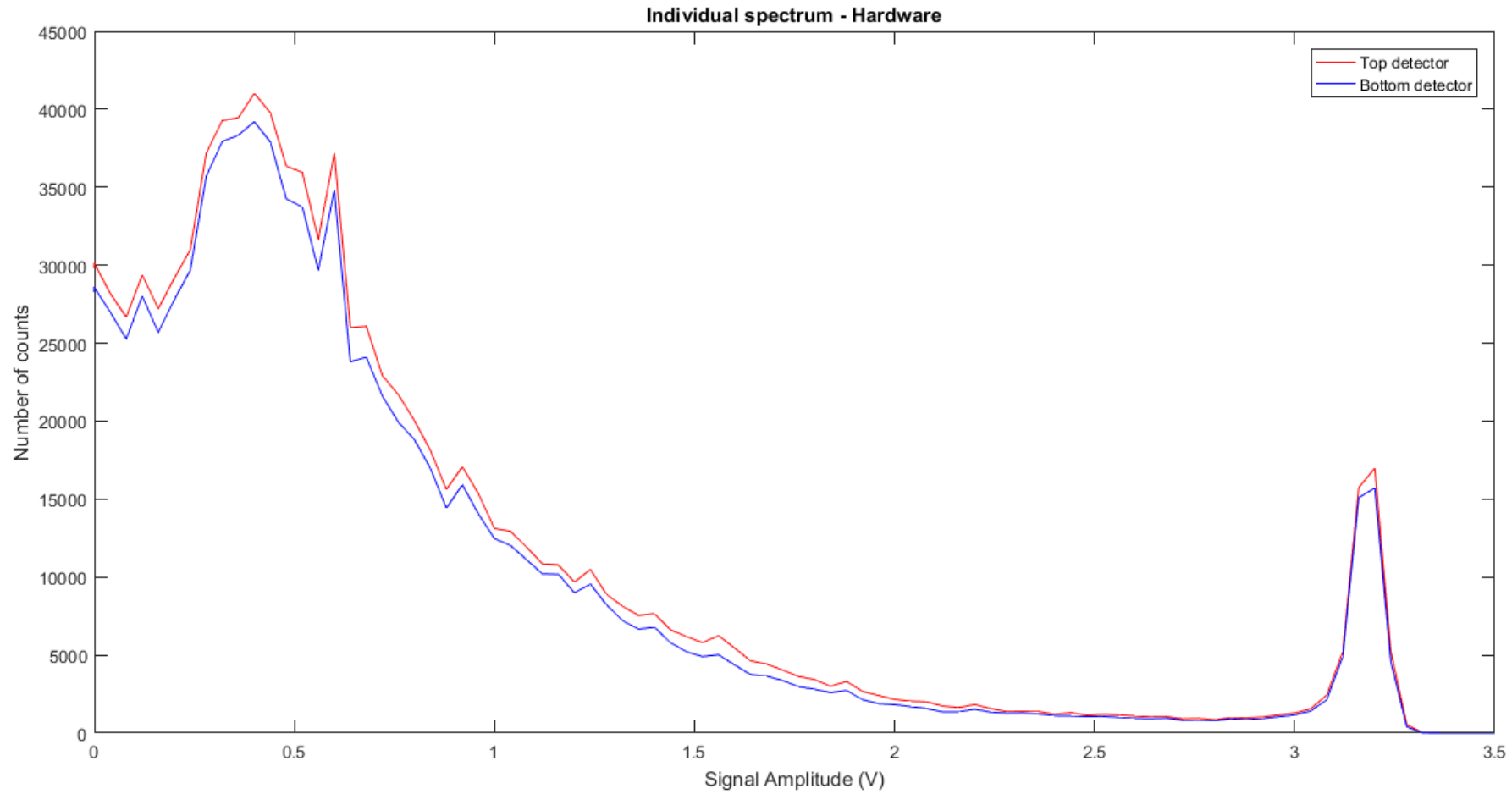


Figure 4 Comparison between the individual spectrums of both detectors.

Hardware Coincidences

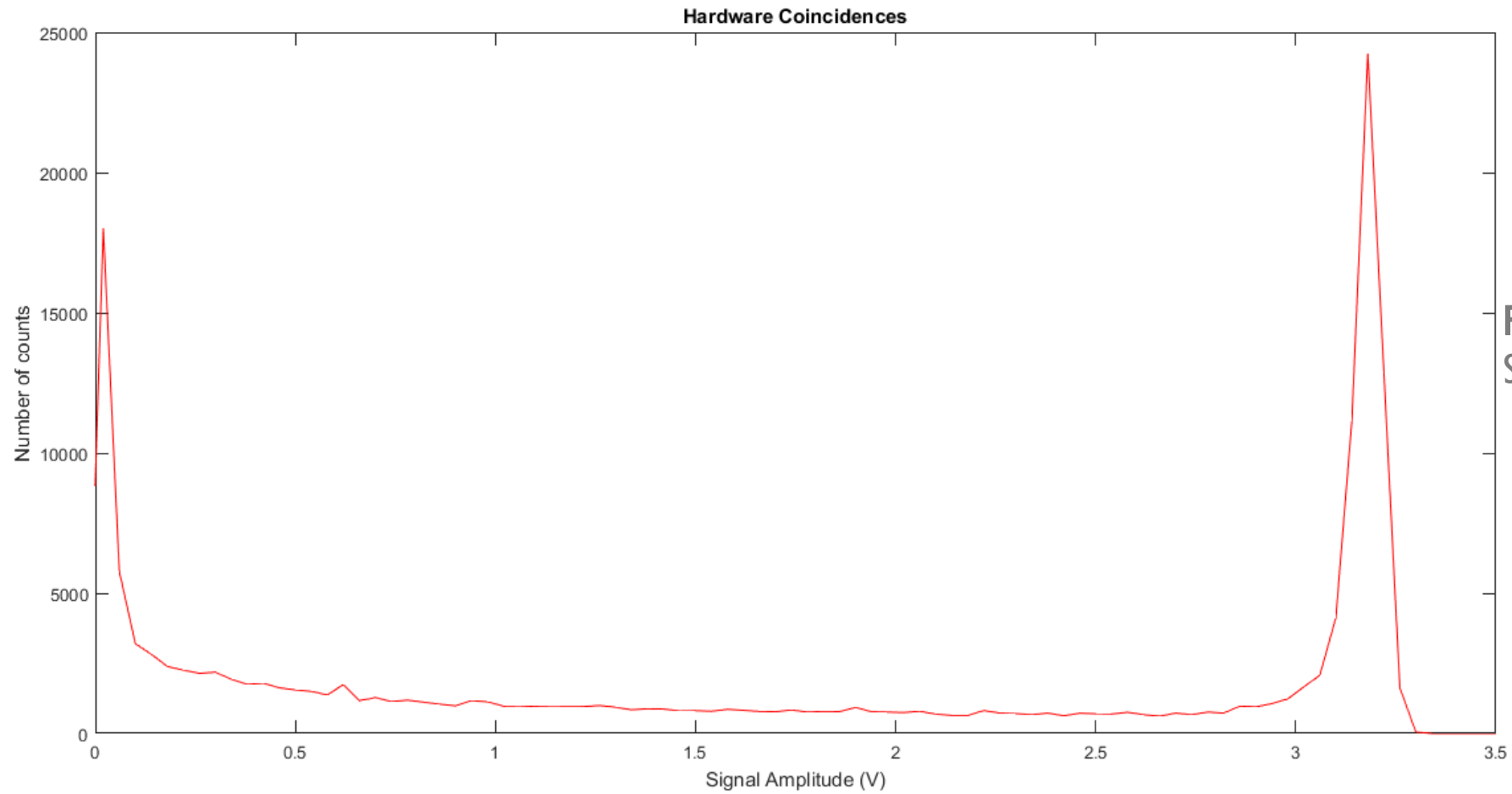


Figure 5 Hardware Coincidence Spectrum

Software Coincidences

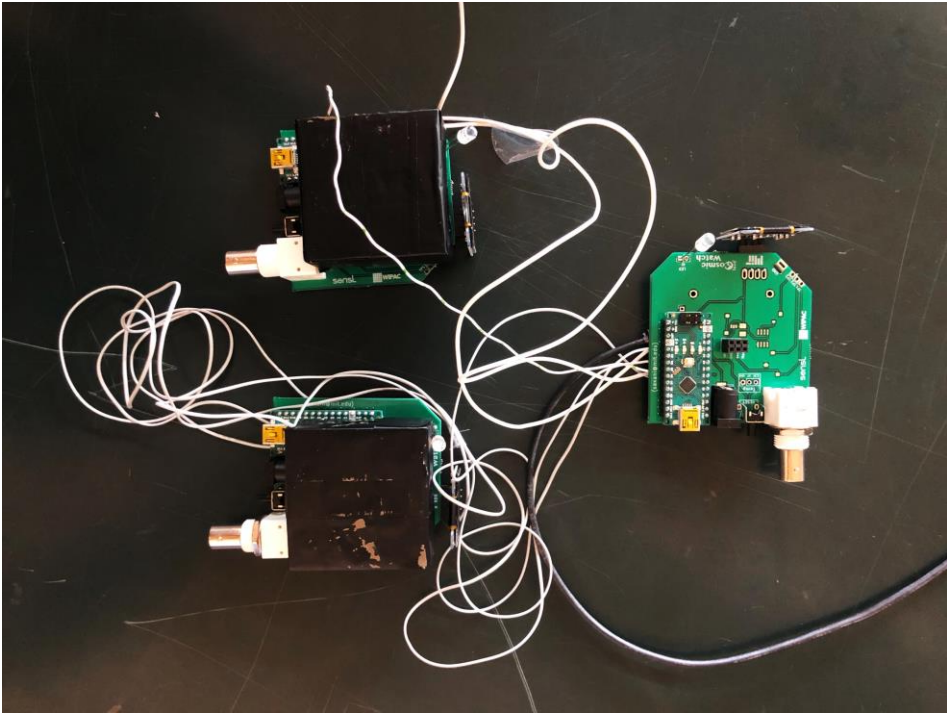
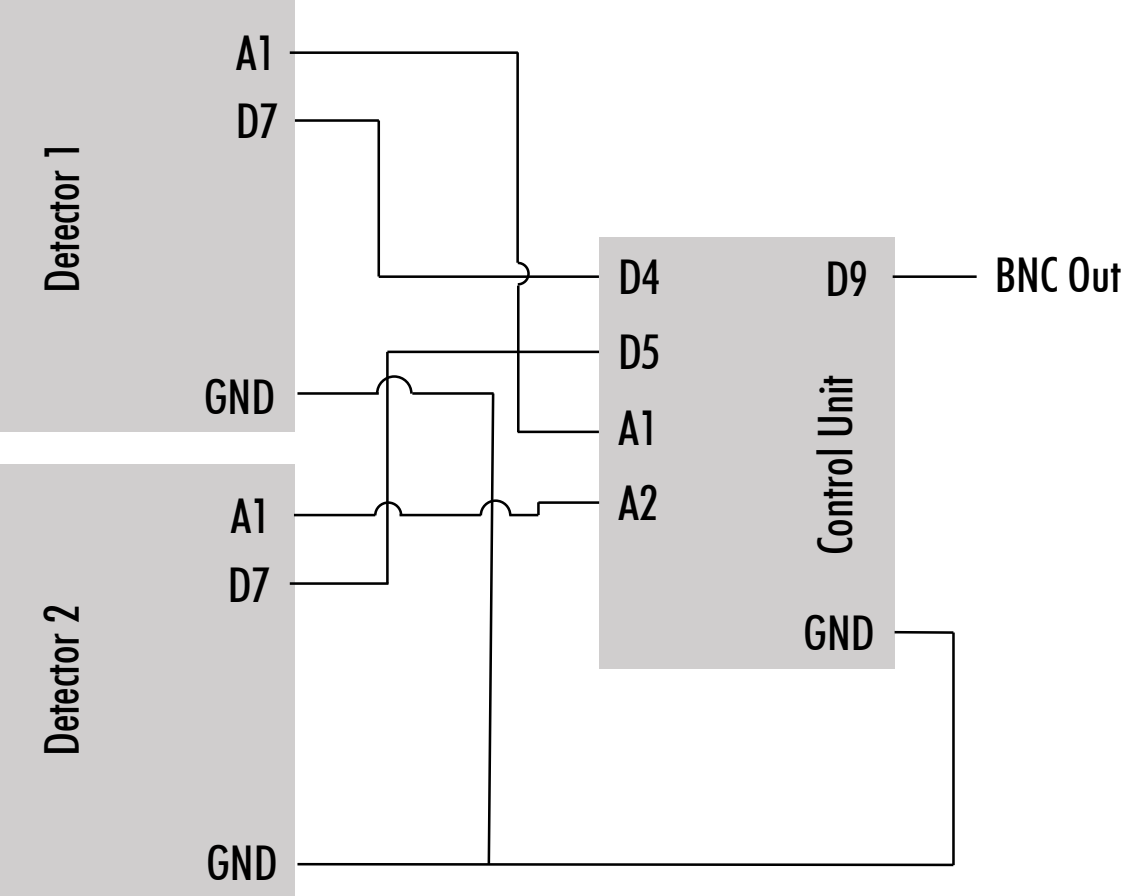


Figure 6 Coincidence circuit setup

Software Coincidences

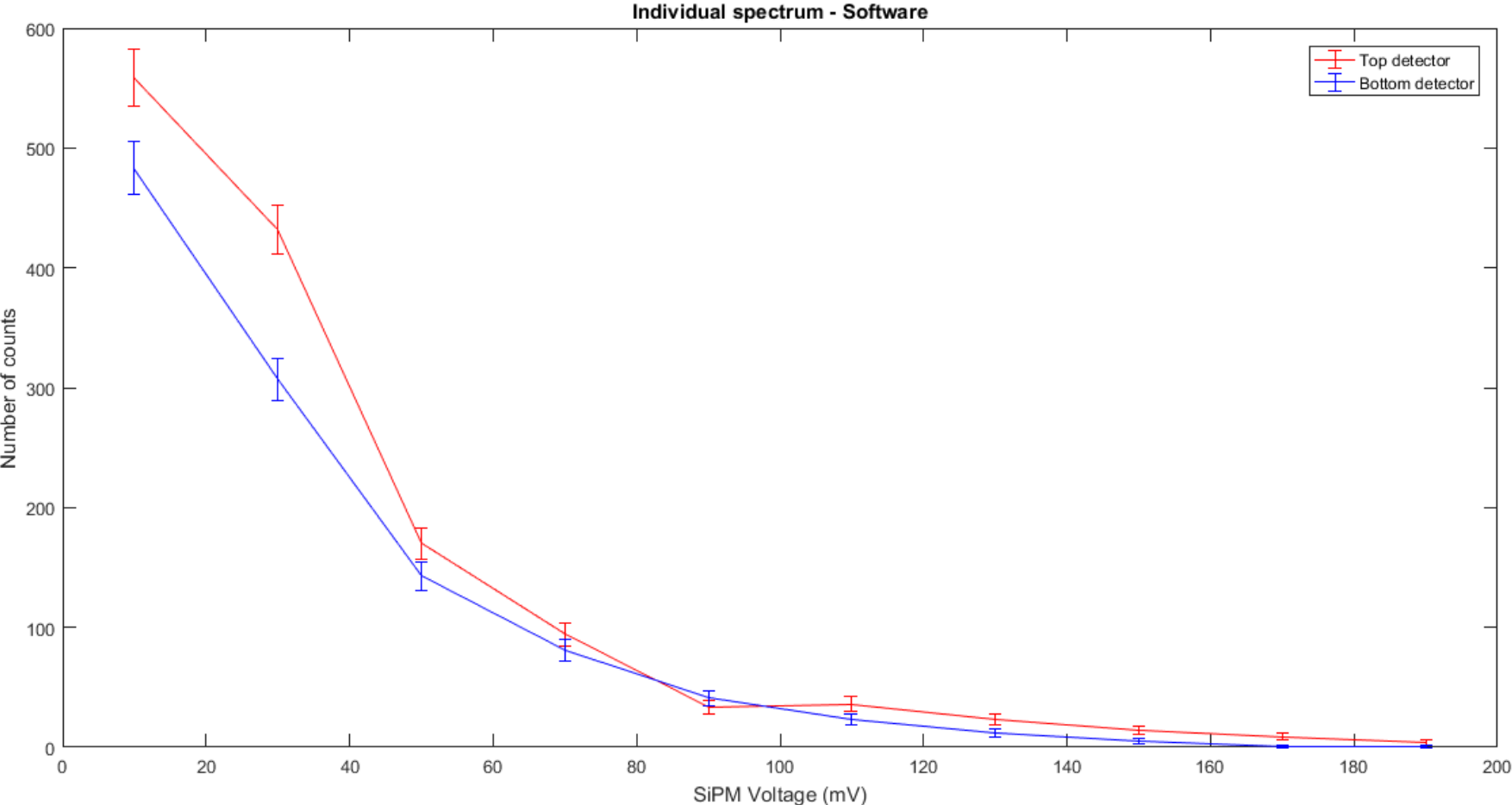


Figure 7 Comparison between the individual spectrums of both detectors.

Software Coincidences

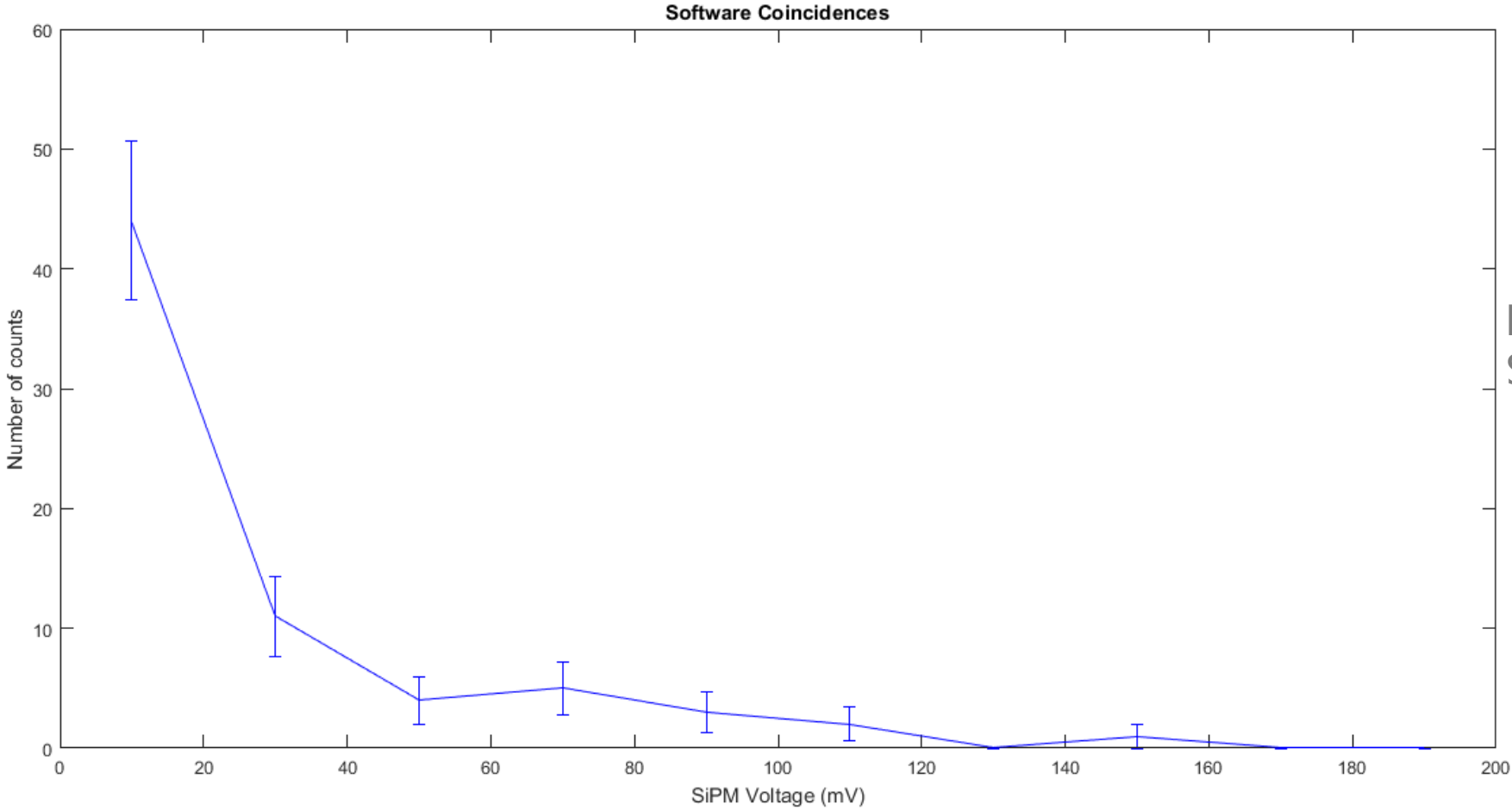


Figure 8 Software Coincidence Spectrum

Angular Distribution



Distance: 11cm

Angular opening: 0.108°

Figure 9 Angular distribution
experimental setup

Angular Distribution

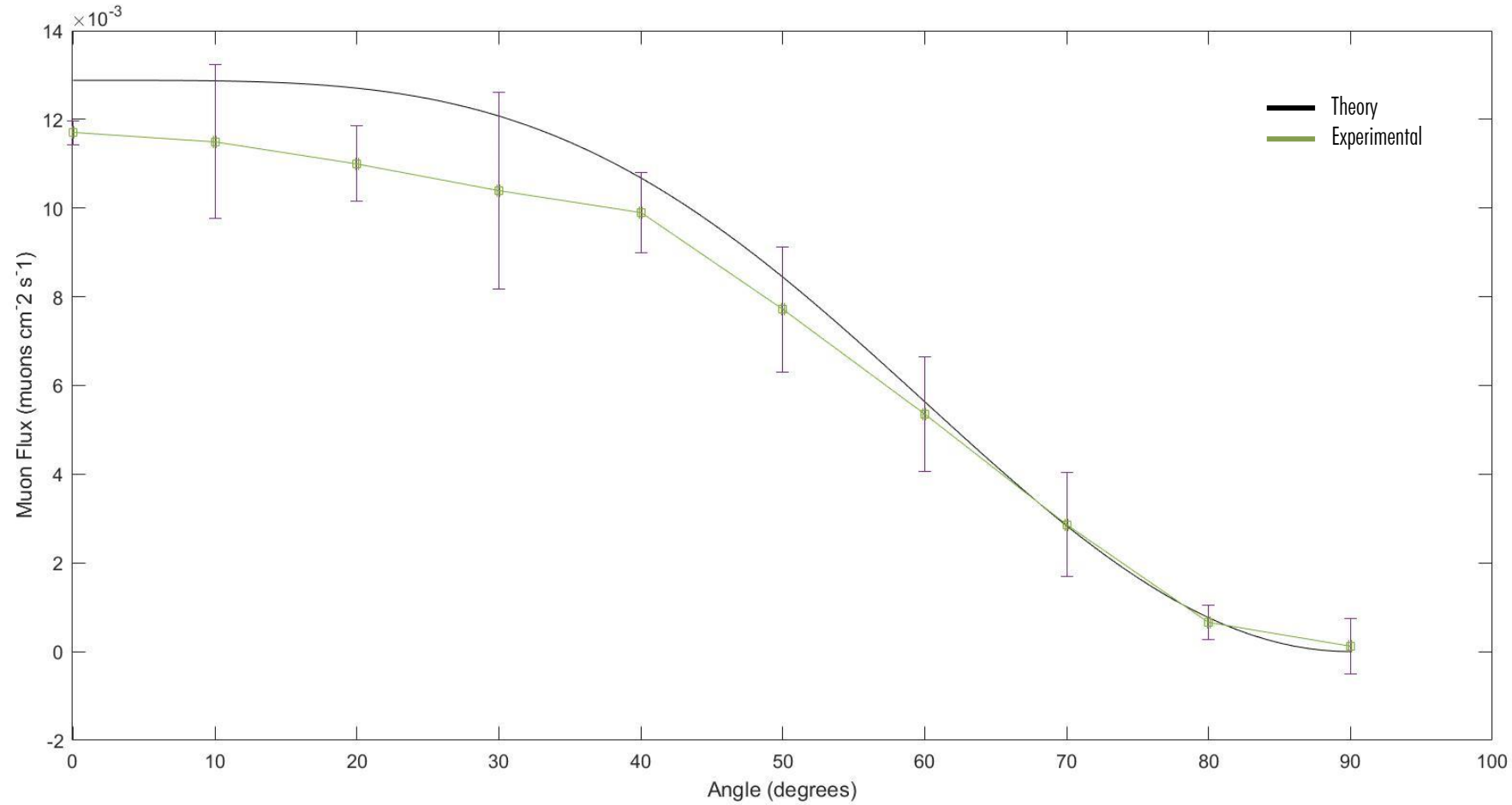


Figure 10 Muon flux angular distribution.

Future Projects

- Optimization;
- Flux variation with altitude;
- Compare statistics with a muon telescope at LIP Coimbra.