

Advanced Lab II: Lab Template

LAB #?: A Lab

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PH326 Section ? Lab Group ?

Experiment Date: ...

Report Due Date: ...

Abstract

A NaI(Tl) scintillation detector was used in recording γ emissions produced by ^{137}Cs and ^{60}Co . Other Things occurred. Some results were found with \pm errors.

Grade	Score
Abstract and Cover Pg.	
Fig. & Plt.	
Data & Error Ana.	
Writing	
Total	

1 Introduction

Some things were important to introduce the reader on about this lab.

2 Apparatus

A cool figure (Figure 1).

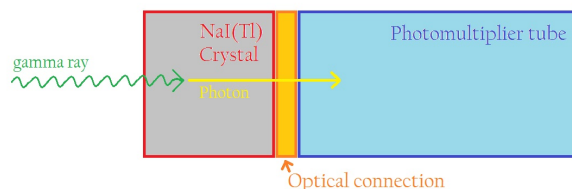


Fig. 1: NaI(Tl) detector, including the crystal, the optical coupling, and the photomultiplier tube.

Yet another! (Figure 2) This is getting interesting now. Really hooking the reader on your lab report.

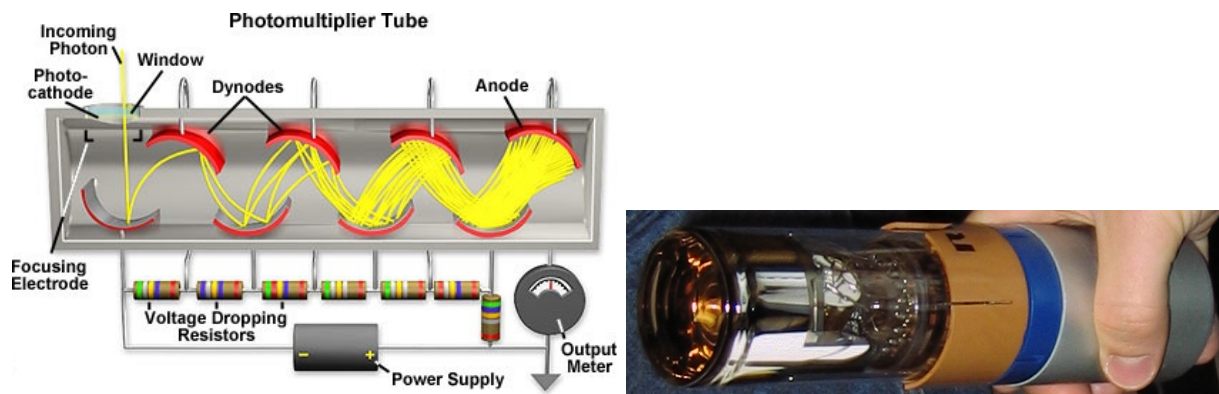


Fig. 2: Photomultiplier tube [2].

3 Data Collection

You might have used the MAESTRO[®] software.

4 Data Analysis

Signals rise time was $\approx 20 \mu\text{s}$ and a fall time that is large comparatively at $\approx 300 \mu\text{s}$. Some data tables might look like:

Source	Energy (keV)	Peak (bin)	Fit FWHM (bin)	Net Area (bin)	Net Count Rate (s)
^{137}Cs	661.657 ± 0.0003	1 ± 1	1	1 ± 1	1
^{60}Co	1173.228 ± 0.0003	1 ± 1	1	1 ± 1	1
	1332.492 ± 0.0004	1 ± 1	1	1 ± 1	1
^{40}K	1460.822 ± 0.0006	1 ± 1	1	1 ± 1	1

Tab. 1: Spectral information from MAESTRO[®]. Energy from [5]

A fancy equation:

$$Energy = mx + B \quad (1)$$

You probably will use [4] to do some error analysis.

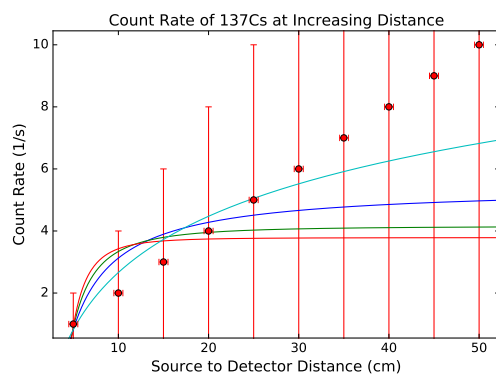


Fig. 3: r^{-1} =Blue, r^{-2} =Green, r^{-3} =Red, $r^{-?}$, Data=Blue points

5 Conclusion

Some good and bad things happened.

References

- [1] Lawrence Wiencke, Professor for PHGN-326. Instructions for Experiments: Experiment 1: Scintillation Detector. Colorado School of Mines, Physics Department, 2017.
- [2] Mortimer Abramowitz & Michael W. Davidson, “Concepts in Digital Imaging Technology, Photomultiplier Tubes”, Last modification: Friday, Jul 16, 2004 at 08:16 AM, <http://micro.magnet.fsu.edu/primer/digitalimaging/concepts/photomultipliers.html>
- [3] C.R. Nave, “Inverse Square Law, Radiation”, Georgia State University, Department of Physics and Astronomy, 2006, <http://hyperphysics.phy-astr.gsu.edu/HBASE/forces/isq.html>
- [4] John R. Taylor, Professor at the University of Colorado Department of Physics. “An Introduction to Error Analysis: The Study of Uncertainties in Physical Measurements” Second Edition, 1982.
- [5] S.Y.F. Chu, L.P. Ekstrm, and R.B. Firestone1. “The Lund/LBNL Nuclear Data Search”, Last Modification: February 1999, <http://nucleardata.nuclear.lu.se/nucleardata/toi/perchart.htm>