

Laboratory Report

TITLE

Poisson Statistics in Nuclear Processes

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Poisson Statistics in Nuclear Processes

Abstract

Statistics of random events was explored by measuring event rates from radioactive sources with Geiger tubes. Few automated and one manual data set were obtained and compared with the predicted theory. Event rates were observed to follow Poisson distribution. Experimental data and theoretical predictions agreed through few tests, such as mean and variance comparison and χ^2 test. Dead times of the Geiger tubes were measured at few different settings and were determined to have little affect on the experimental results.

Table of Contents

| | |
|--|----|
| I. INTRODUCTION..... | 1 |
| II. THEORY..... | 1 |
| A. Poisson Distribution..... | 2 |
| B. Geiger Counter[3]..... | 3 |
| C. χ^2 Test [4]..... | 4 |
| III. APPARATUS..... | 5 |
| IV. PROCEDURE..... | 6 |
| V. EXPERIMENTAL DATA AND ANALYSIS..... | 6 |
| VI. CONCLUSION..... | 18 |
| VII. RERERENCES..... | 19 |
| APPENDIX A: CALCULATIONS..... | 20 |

I. INTRODUCTION

The results of measuring random events in nuclear processes are presented in this report. Random events in this laboratory were supplied by pulses from a Geiger counter which was exposed to gamma rays from a radioactive source. Both manual and automated setups were used for data collection. The experimental data was checked for agreement with theoretical Poisson distribution predictions by χ^2 test and statistical comparison.

II. THEORY

This experiment relied heavily on the theory of Poisson Distribution and the operation of Geiger