Università degli Studi di Padova

Dipartimento di Fisica e Astronomia "Galileo Galilei"

Degree in Physics

Physics Laboratory report

Compton Scattering

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Academic Year 2017-2018

Introduction

Compton scattering represents the main type of γ-matter interaction with γ energy of the MeV order. The aim of this experiment is to present the study of Compton Scattering performed with the experimental Set Up described in the following section. This report will analyze these steps:

- Energy calibration of the three inorganic scintillators.
- Verification of the relationship between energy and angle of the diffused photon.
- Measure of the differential cross section of Compton Scattering.

Energy Calibration

The first task is the energy calibration of the three detectors:

- Tagger
- Scatterer
- Detector

For the purpose of energy calibrating these detectors two different radioactive source were used:

1. ^{22}Na: with two different photopeak at 511 keV and 1275 keV
2. ^{241}Am: with a photopeak at 59.5 keV

Calibrated spectra are showed in Fig. 1.

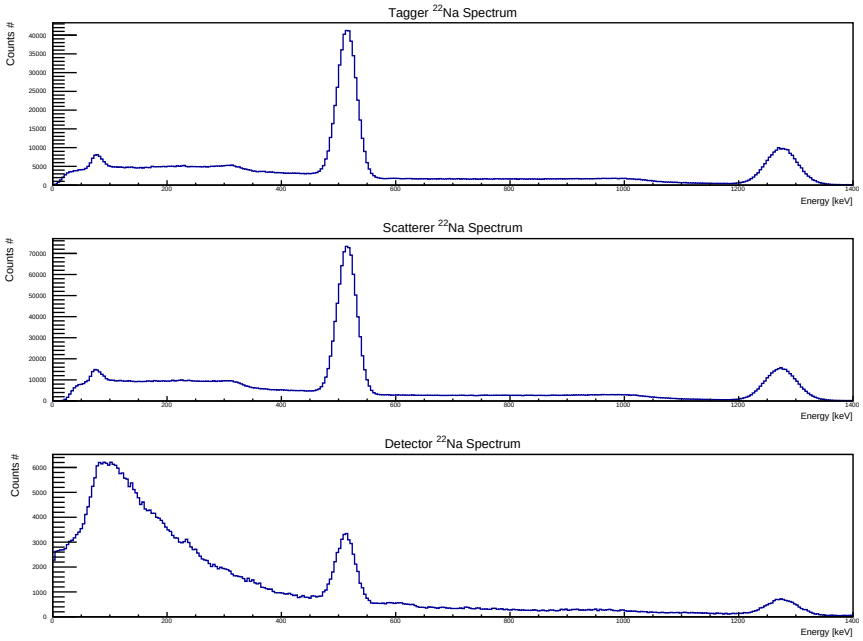

Figure 1: Calibrated ^{22}Na energ spectrum.

	P0 [keV]	P1 [keV/ch]
Tagger	-6±1	0.54436±0.00006
Scatterer	-8±4	0.0577±0.0003
Detector	-7±1	0.05318±0.00007

Table 1: Calibration Parameters