Compton Scattering Experiment

In this experiment $\gamma$ rays of energy 66 MeV, from a a $^{137}Cs$ source, are incident on an aluminum target. The scattered photons are detected by a NaI scintillator which is viewed by a photomultiplier.

![Diagram of the Compton scattering experiment](image)

Figure 1: Block diagram of the Compton scattering experiment. The MCA is a card in the computer.

The photomultiplier signal is amplified, and sent to a Multi-channel analyzer (MCA), which produces a histogram which is proportional to the energy spectrum. The MCA data may be written out as a text file.

The MCA is calibrated with a smaller $^{137}Cs$, and a $^{60}Co$ source, which produces $\gamma$'s of two different energies.

The goals of the experiment are:

1. Measure the scattered photon energy as a function of scattering angle. Make a graph which shows the measurements and predictions together.

2. Measure the differential scattering cross section, to within a constant. That is, it is not necessary to measure the absolute value of the cross section, just its shape.

The physics and experimental methods, except for the MCA, are well-described in Experiments in Modern Physics, by A. C. Melissinos and Jim Napolitano; Academic Press (2003).