To find out the γ photon energy we calibrate the channel to the energy using known energy values for the photopeaks for the $^{60}_{27}$Co peaks. We will then use it the calibration to determine the energy of the γ ray photon emitted by $^{137}_{55}$Cs.

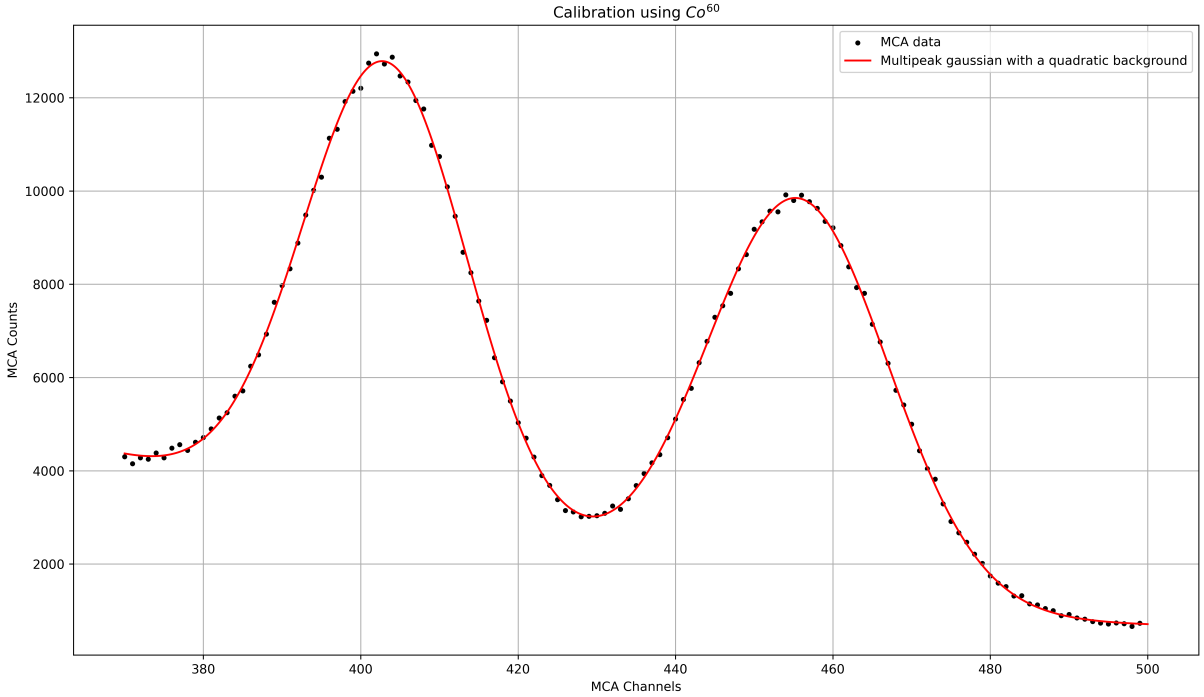

Figure 1: Calibration of MCA using $^{60}_{27}$Co

The centroids are given as

Centroid of 1.17 Mev peak $(C_1) = 403.26$
Centroid of 1.32 MeV peak $(C_2) = 455.542$

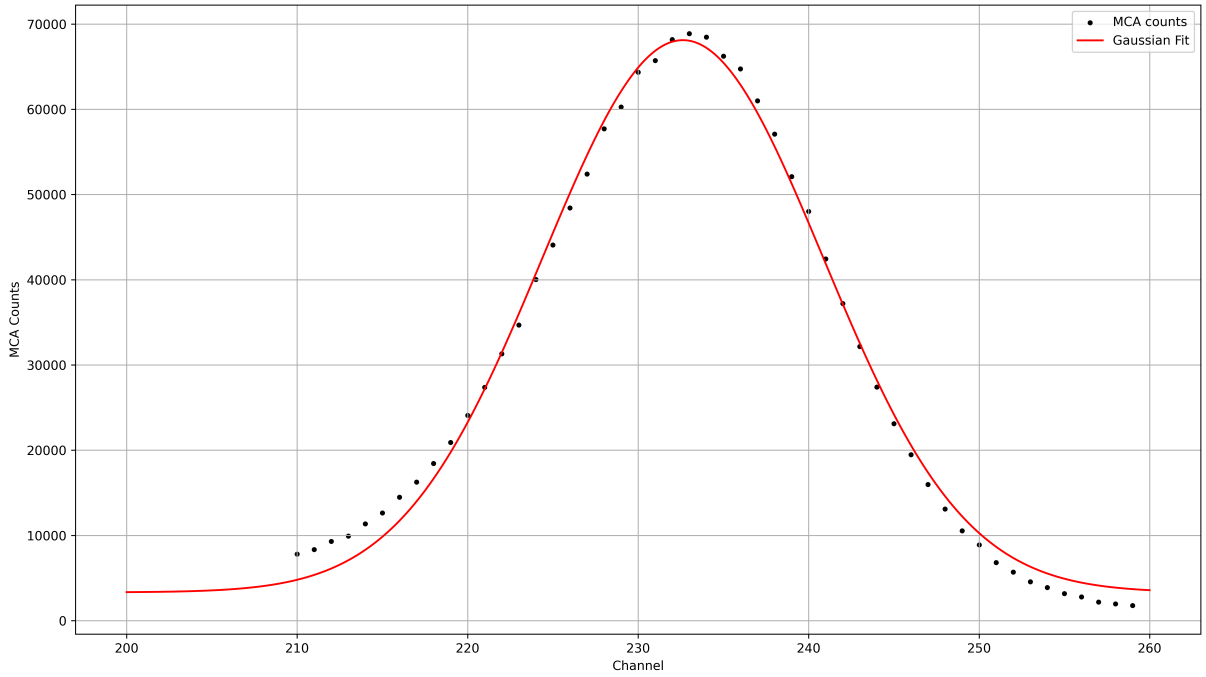

Figure 2: Determination of $^{137}_{55}$Cs γ photon

The Centroid of the the gaussian fit on the $^{137}_{55}$Cs spectrum is $(C_E) = 232.62 \pm 0.08$. Fitting the Caesium photo peak with a gaussian and then using the calibration done above we get the energy of $^{137}_{55}$Cs γ photon to be

$$\boxed{E = \frac{1.33 - 1.17}{C_2 - C_1} \times (C_E)\text{MeV} = 0.003 * C_E \text{ MeV} = 0.697 \pm 0.159 \text{ MeV}}$$

The energy of the γ ray photon emitted by $^{137}_{55}$Cs is 0.697 ± 0.159