

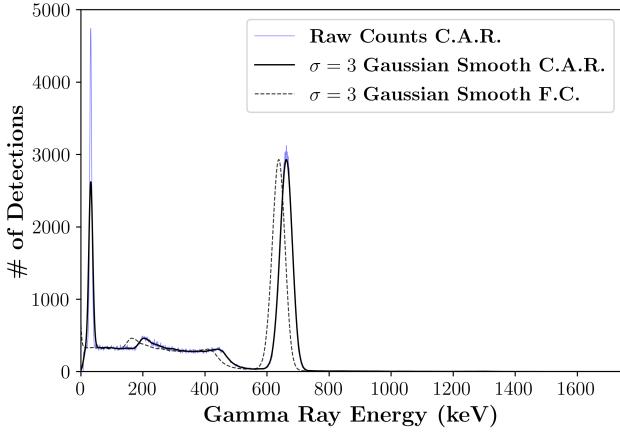
Analysis of Gamma Ray Spectra from Reference Isotopes with Multi-Channel Analyzers

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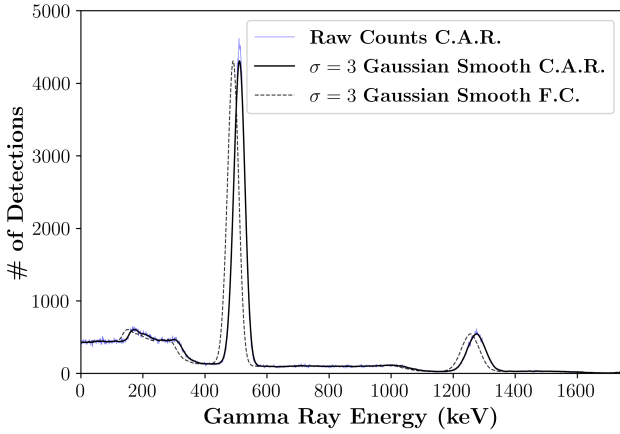
Abstract—stuff

I. RESULTS AND DISCUSSION

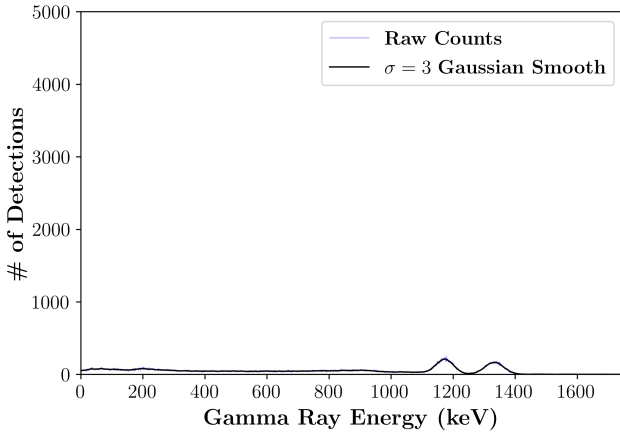
A. Calibration Process



(a) ^{137}Cs Gamma Ray Spectra



(b) ^{22}Na Gamma Ray Spectra



(c) ^{60}Co Gamma Ray Spectra

Fig. 1: Gamma ray spectra for known isotopes of Cesium (^{137}Cs), Sodium (^{22}Na), and Cobalt (^{60}Co). Cobalt was the final isotope tested, and the calibration metrics calculated for it were used for the rest of the experiment. For the Cesium and Sodium isotopes, the spectra with the calibration at recording (C.A.R.), is shown in solid black, and the spectra adjusted with the final calibration (F.C.) is shown in dashed gray. Raw counts for all isotopes are shown in blue, though these are often obscured by the $\sigma = 3$ gaussian smoothed curves.

B. Background Radiation

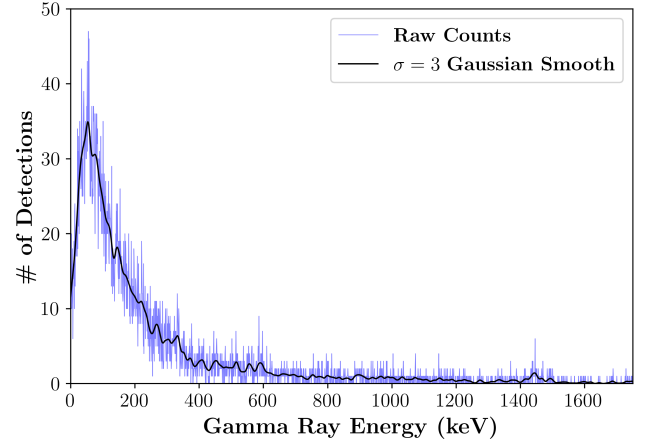


Fig. 2: Background radiation profile.

C. Analysis of Unknown Sample

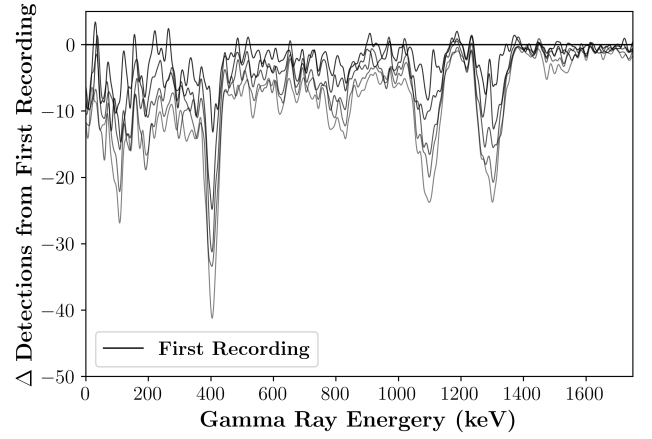


TABLE I: Total counts and peak energies with with increasing time since first measurement.

Sample Number	$T+$ (s)	Total Counts	Peak 1 Energy	Peak 2 Energy	Peak 3 Energy	Peak 4 Energy
1	0s	68493	401.24 keV	815.92 keV	1096.59 keV	1296.46 keV
2	420s	63755	400.52 keV	799.32 keV	1106.59 keV	1295.25 keV
3	819s	59850	401.25 keV	796.80 keV	1099.32 keV	1293.16 keV
4	1199s	56863	400.35 keV	759.04 keV	1097.07 keV	1295.73 keV
5	1559s	53111	401.94 keV	805.54 keV	1104.55 keV	1296.78 keV
6	1936s	50483	400.41 keV	812.17 keV	1085.92 keV	1292.84 keV

APPENDIX

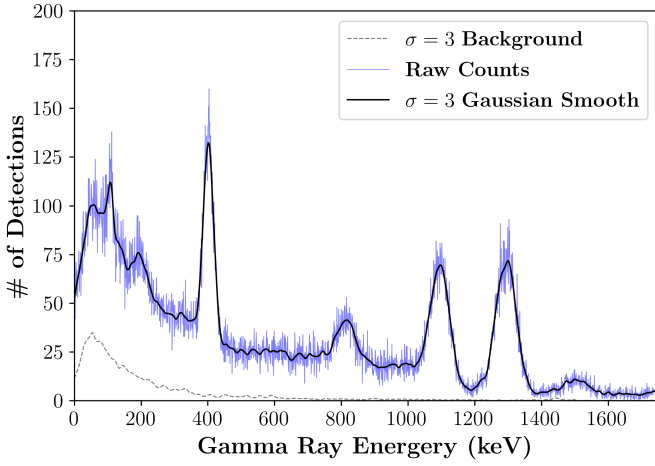
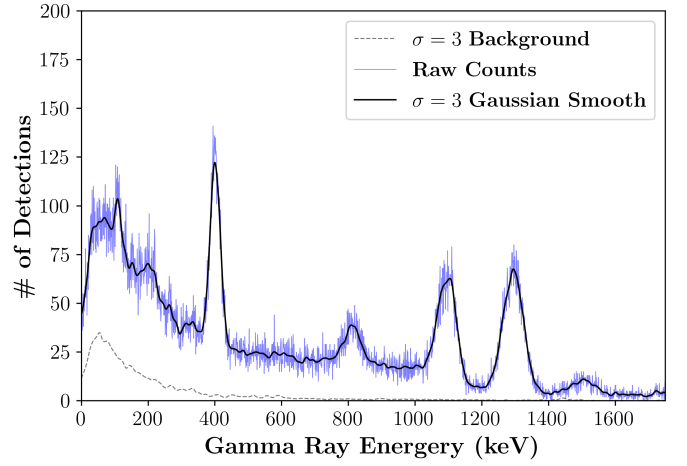
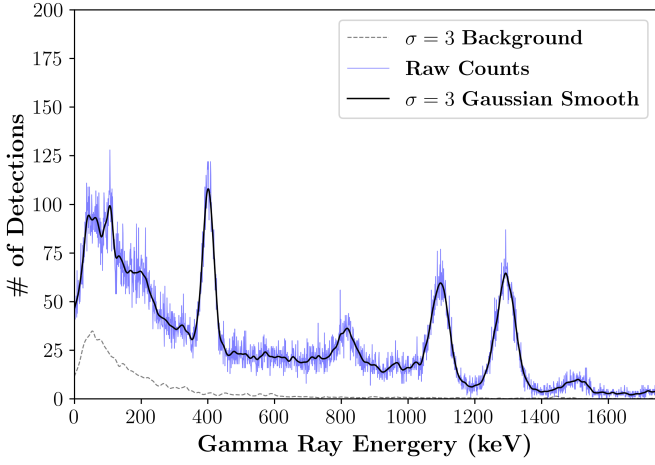
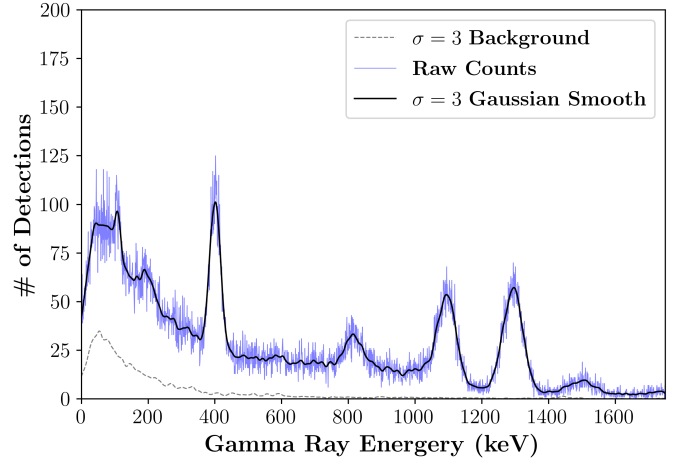
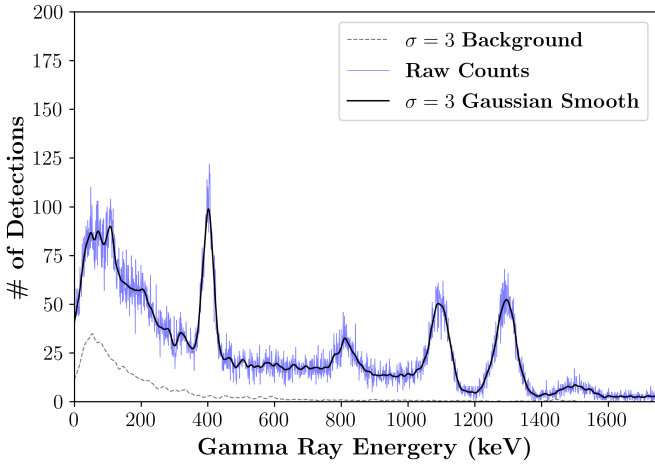
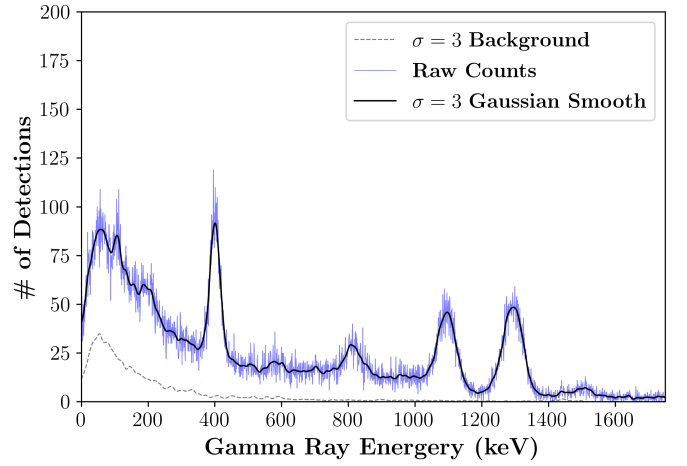
(a) Recording 1, hh:mm:ss, $T+$ minutes(b) Recording 2, hh:mm:ss, $T+$ minutes(c) Recording 3, hh:mm:ss, $T+$ minutes(d) Recording 4, hh:mm:ss, $T+$ minutes(e) Recording 5, hh:mm:ss, $T+$ minutes(f) Recording 6, hh:mm:ss, $T+$ minutes

Fig. 3: Raw count data for each recording of gamma rays from the unknown isotope.