

Summary

- Example spectra obtained on 3-inch CsI-Advantage detector with an integration time of 50 μ s at all energies.

- The detector achieves 8.6% fwhm at 122 keV, 5.5% at 662 keV, 4.0% at 1333 keV and 3.1% at 2615 keV.

Summary Table

CsI-Advantage provides excellent stopping power and outstanding energy resolution. Unlike LaBr3 it has no intrinsic radioactivity and is well-suited for low-background radiation measurements and monitoring.

In table 1 we compare the energy resolutions of a crystal as obtained with a regular CsI(Na) and 10 μ s integration time with a CsI-Advantage detector. In table 2 we report the improvement of the non-proportionality.

<i>Energy/ keV</i>	<i>dE/E, % regular</i>	<i>dE/E, % Advantage</i>	<i>Energy / keV</i>	<i>dE/E, % regular</i>	<i>dE/E, % Advantage</i>
59.54	12.8	11.8	662	6.40	5.51
121.8	10.0	8.55	1332.5	4.62	4.03
344.3	8.22	7.39	2614.5	3.50	3.15

Table 1: Energy resolution with regular CsI(Na) and with CsI-Advantage detectors.

<i>Energy/ keV</i>	<i>NP, % regular</i>	<i>NP, % Advantage</i>	<i>Energy / keV</i>	<i>NP, % regular</i>	<i>NP, % Advantage</i>
59.54	11.6	8.25	662	0.00	0.00
121.8	6.68	5.37	1332.5	-1.49	-1.66
344.3	1.75	1.65	2614.5	-2.33	-2.76

Table 2: Non-proportionality with regular CsI(Na) and with the CsI-Advantage detectors.

Below we show a number of spectra obtained with the CsI-Advantage detector to highlight the performance. All data were acquired on the same 3-inch by 3-inch CsI(Na)-Advantage detector.

Co-57 spectrum

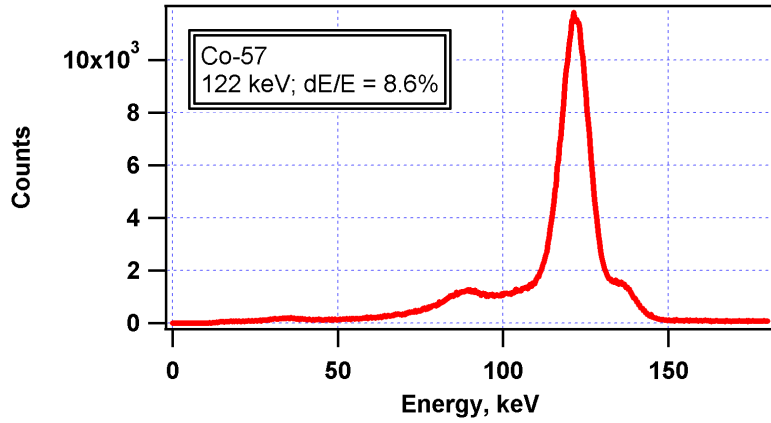


Figure 1: Co-57 spectrum. The secondary line at 136 keV is recognizable as a distinct shoulder on the right-hand side of the main peak at 122 keV.

Eu-152 spectrum

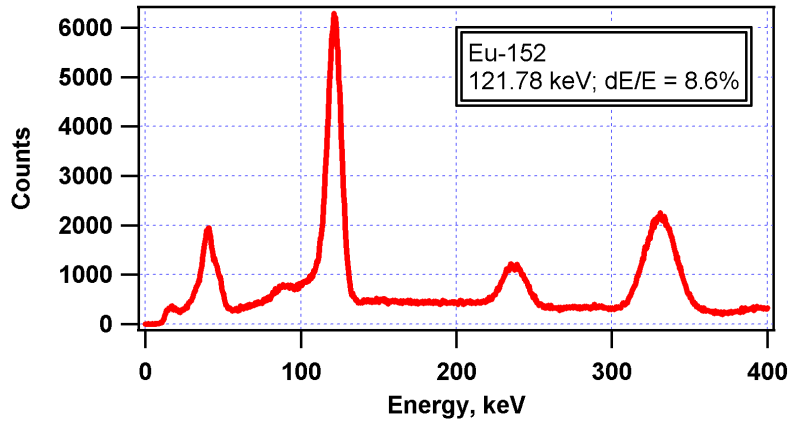


Figure 2: Eu-152 spectrum. The tallest peak is at 121.78 keV and is well isolated.

Cs-137 spectrum

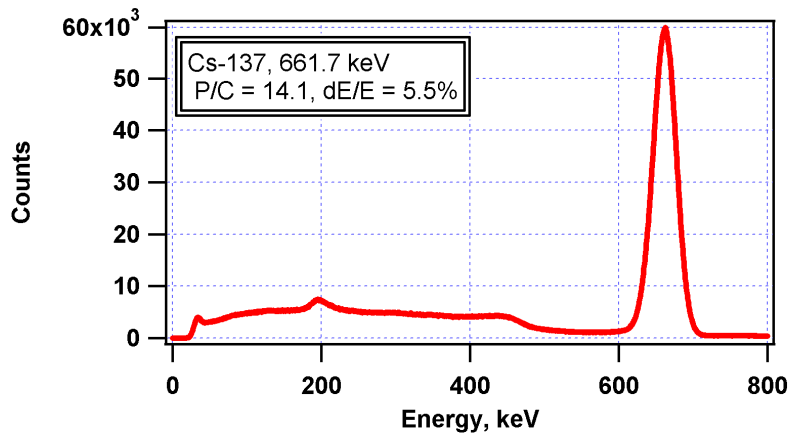


Figure 3: Cs-137 spectrum. Note the high Peak/Compton ratio of 14.1.

Co-60 spectrum

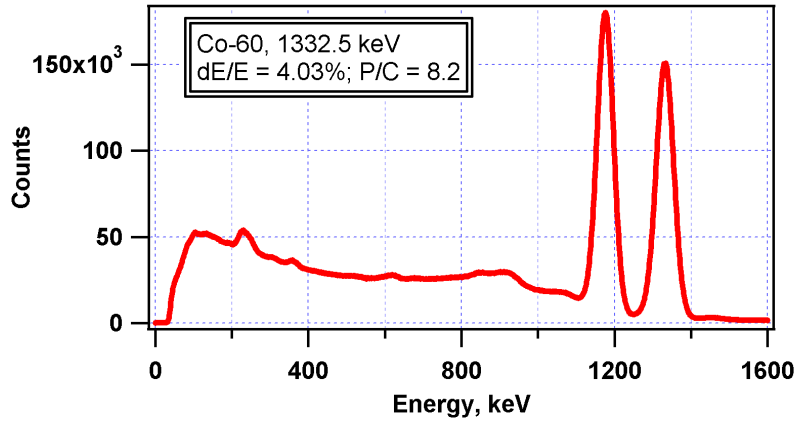


Figure 4: Co-60 spectrum, acquired over 16 hours.

Co-60 spectrum

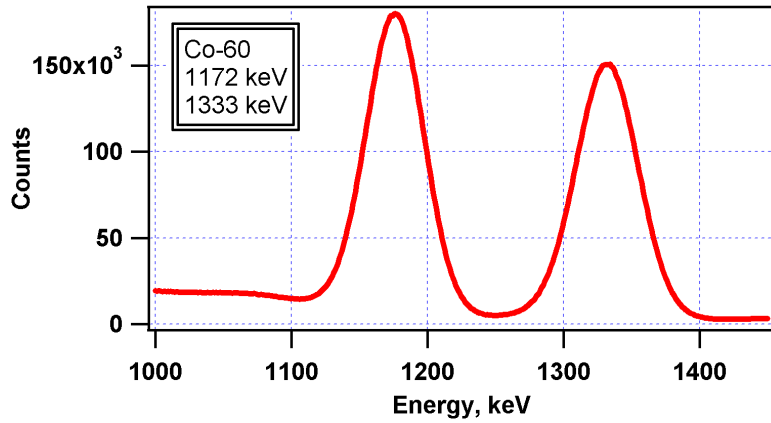


Figure 5: Co-60 spectrum; Zoom-in to highlight the excellent double peak separation.

Th-nat spectrum

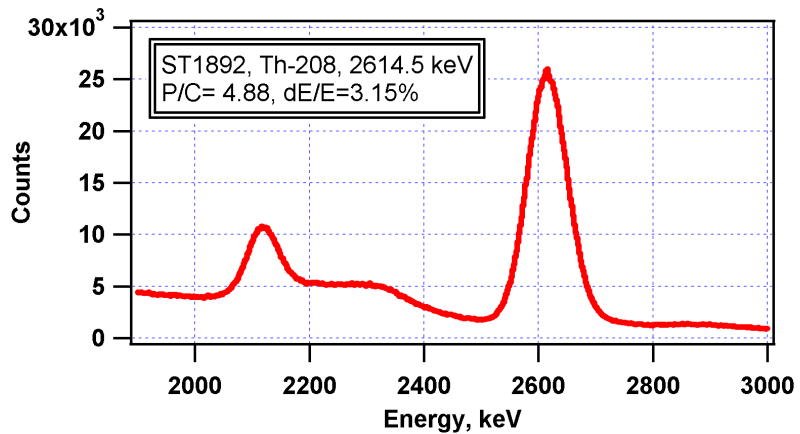


Figure 6: Th-nat spectrum acquired over 16 hours. Focus on Tl-208, 2615 keV.

