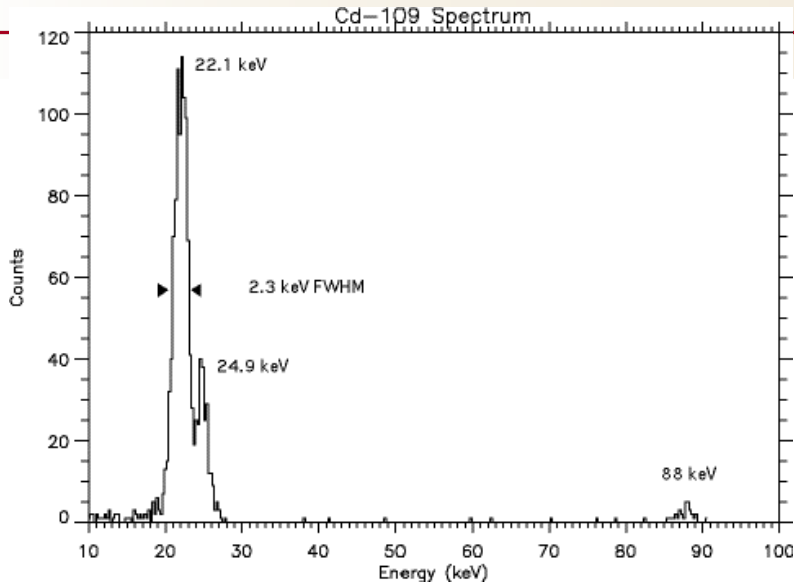


Source Cd109

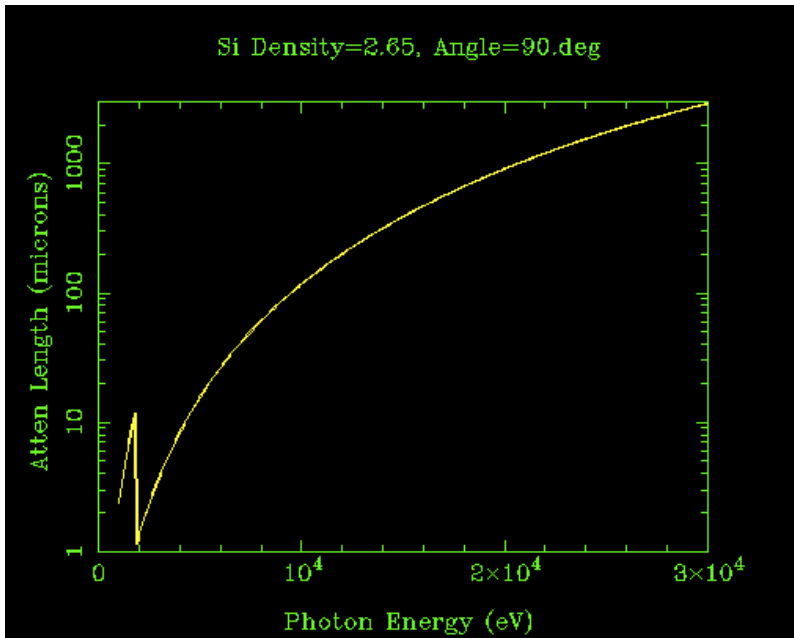


Gammas from ^{109m}Ag (39.6 s 2)

Eg (keV)	Ig (%)	Decay mode
88.04 5	3.66	IT

X-rays from ^{109m}Ag (39.6 s 2)

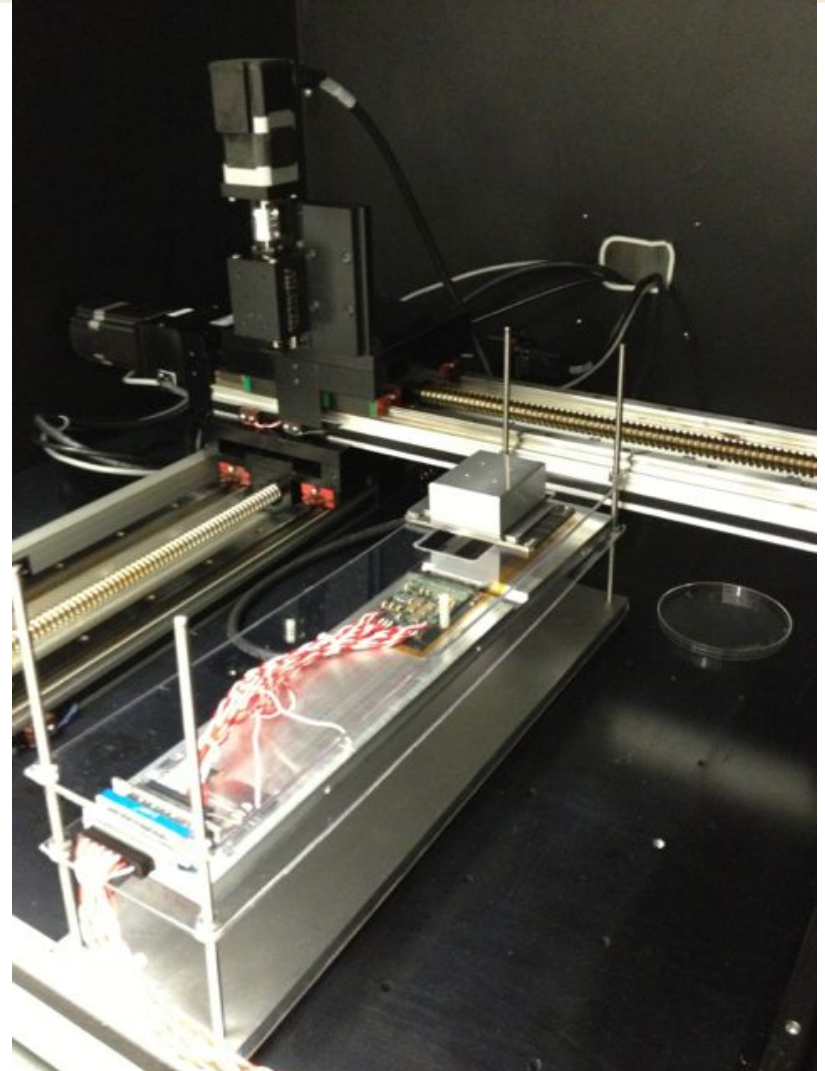
E (keV)	I (%)	Assignment
2.634	0.088 15	Ag L _l
2.806	0.053 8	Ag L _h
2.978	0.24 4	Ag L _{a2}
2.984	2.1 3	Ag L _{a1}
3.151	1.46 22	Ag L _{b1}
3.203	0.033 8	Ag L _{b4}
3.234	0.051 13	Ag L _{b3}
3.256	0.0144 23	Ag L _{b6}
3.348	0.28 5	Ag L _{b2}
3.520	0.155 24	Ag L _{g1}
3.743	0.0063 16	Ag L _{g2}
3.750	0.011 3	Ag L _{g3}
21.708	0.000415 15	Ag K _{a3}
21.990	10.1 3	Ag K _{a2}
22.163	18.9 5	Ag K _{a1}
24.912	1.62 5	Ag K _{b3}
24.943	3.12 9	Ag K _{b1}
25.144	0.0227 10	Ag K _{b5}
25.455	0.781 22	Ag K _{b2}
25.511	0.166 7	Ag K _{b4}



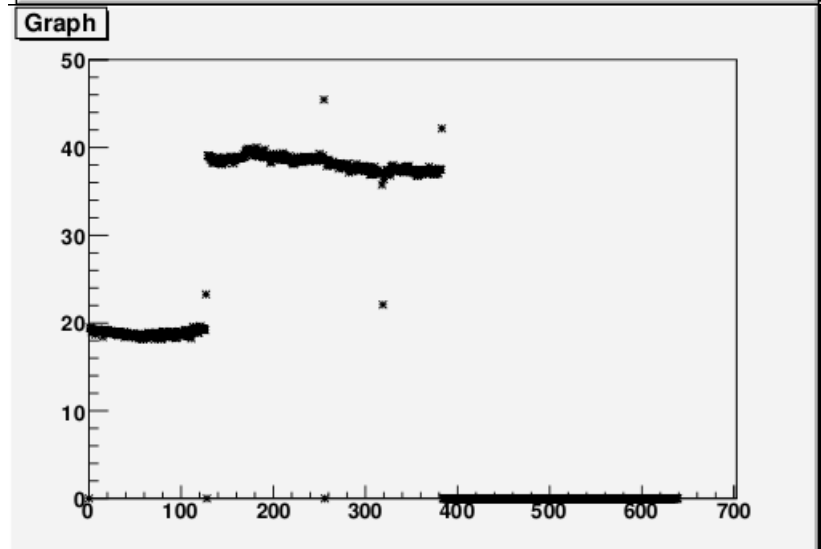
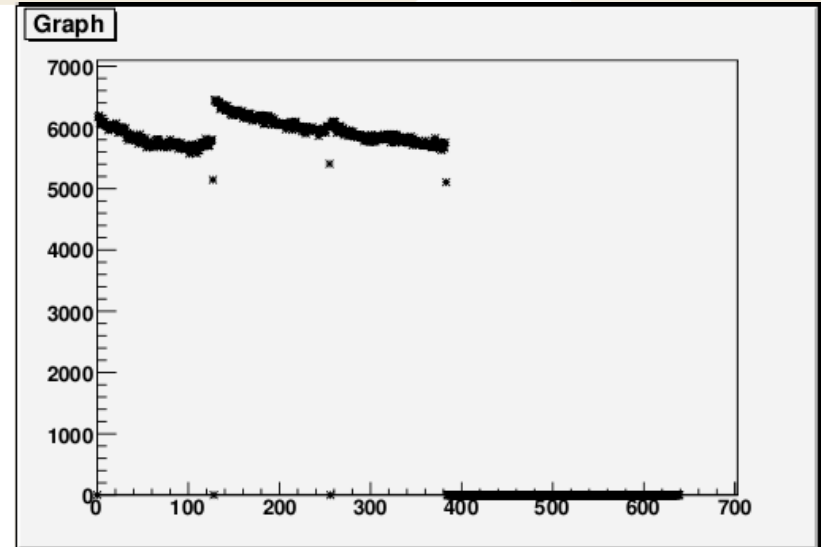
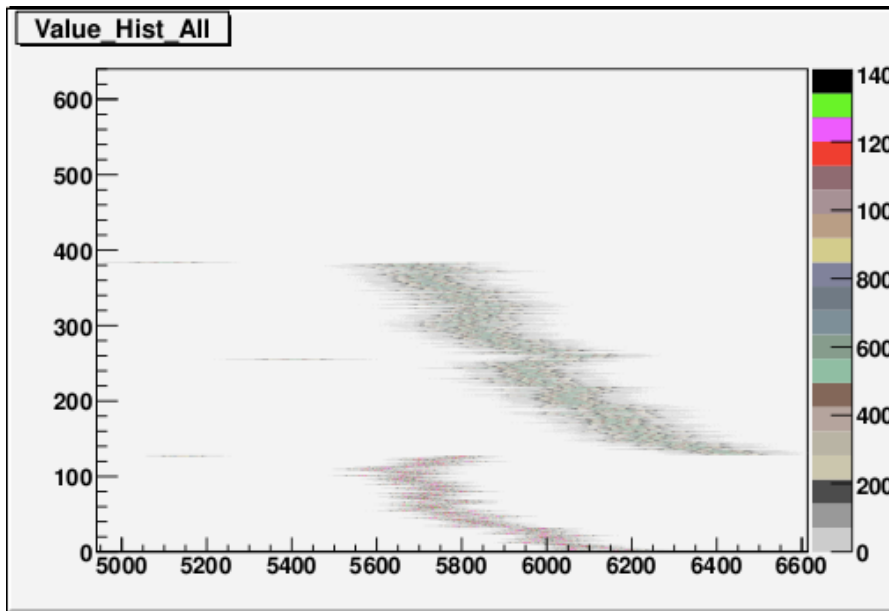
Source Test Estimates

Source at 2.0cm above Si
Area of Si illuminated 3.14159265359 cm²
Solid angle fraction 0.0625
Source: Cd(48,109) 0.01 Ci Approx. X-Ray energy in keV 22.0
BR to gammas: 0.336
Decays per second to gammas: 124320000.0
Decays from source hitting Si per second 7770000.0
Lin. Att. Coeff 10.40112 cm⁻¹
Lin. Att. in 0.032 cm Si is 0.716887868809
Hits per second in Si 5570218.74065
Trigger rate in Hz 1000.0
Window time in ns 150.0
Live time fraction per second 0.00015
Hits in time on Si 836 per second or 3.01e+06 per hour

Setup

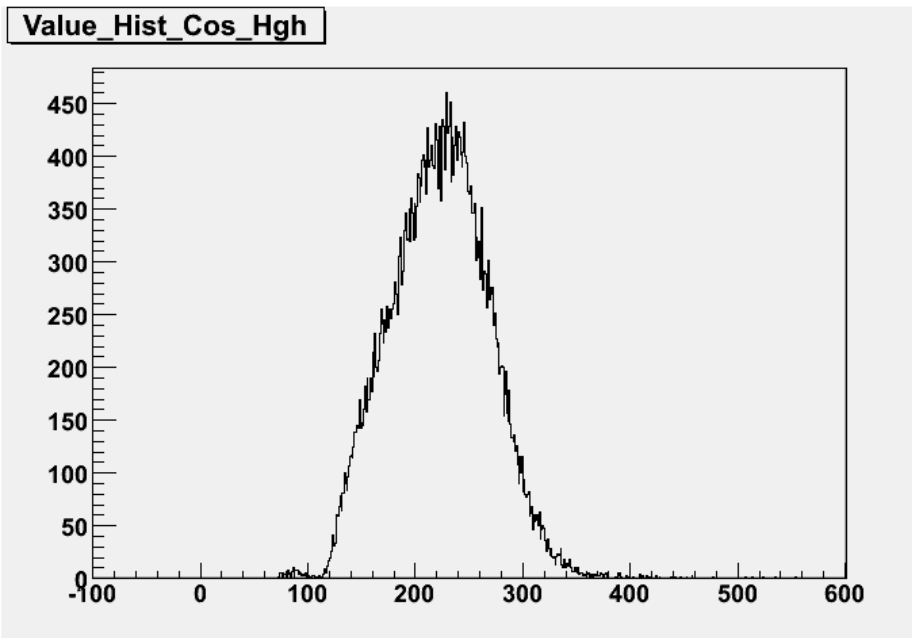


Baseline - gimp

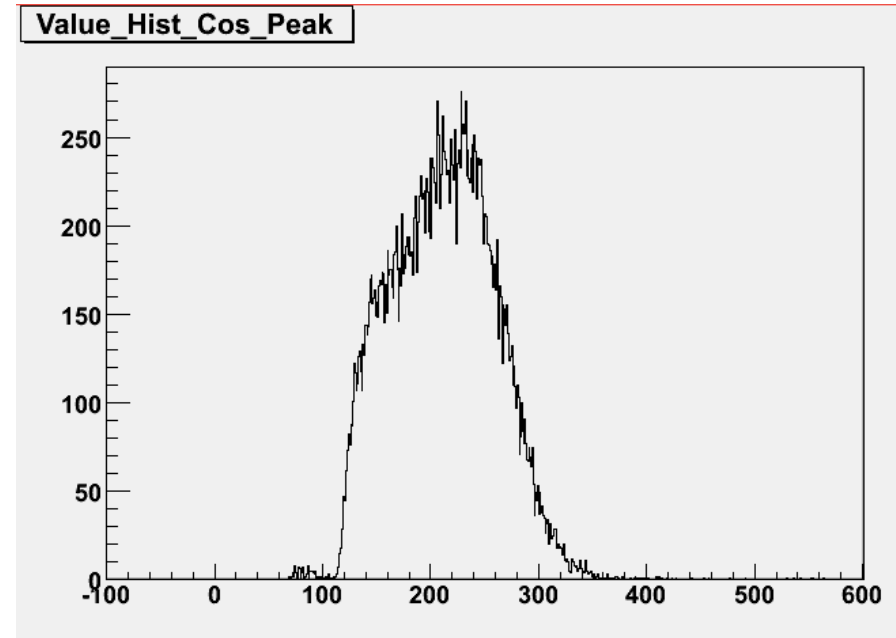


Source Run - gimp

~500k triggers, pedestal subtracted



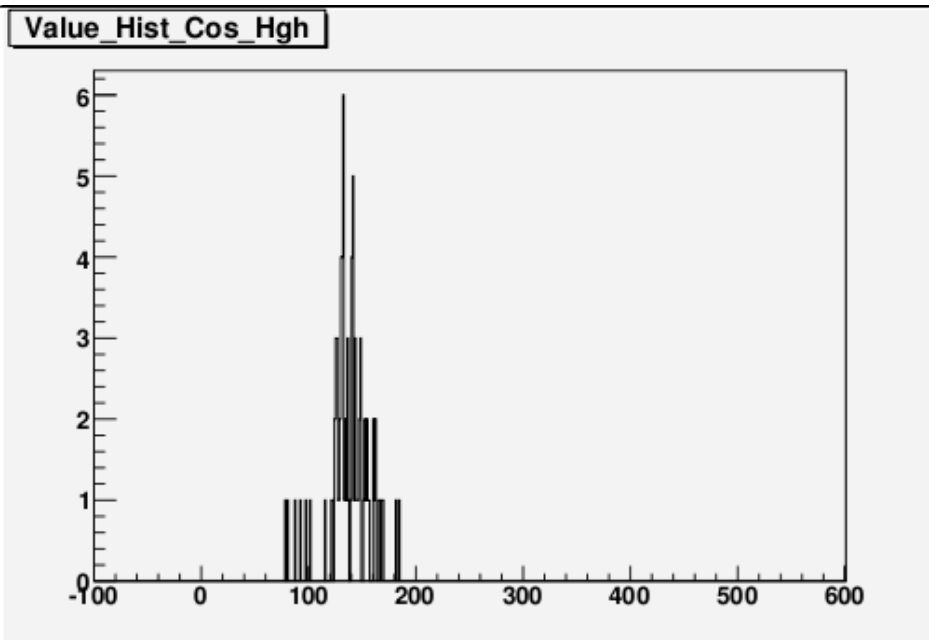
3 consecutive samples above 3 sigma
Highest sample among the 6



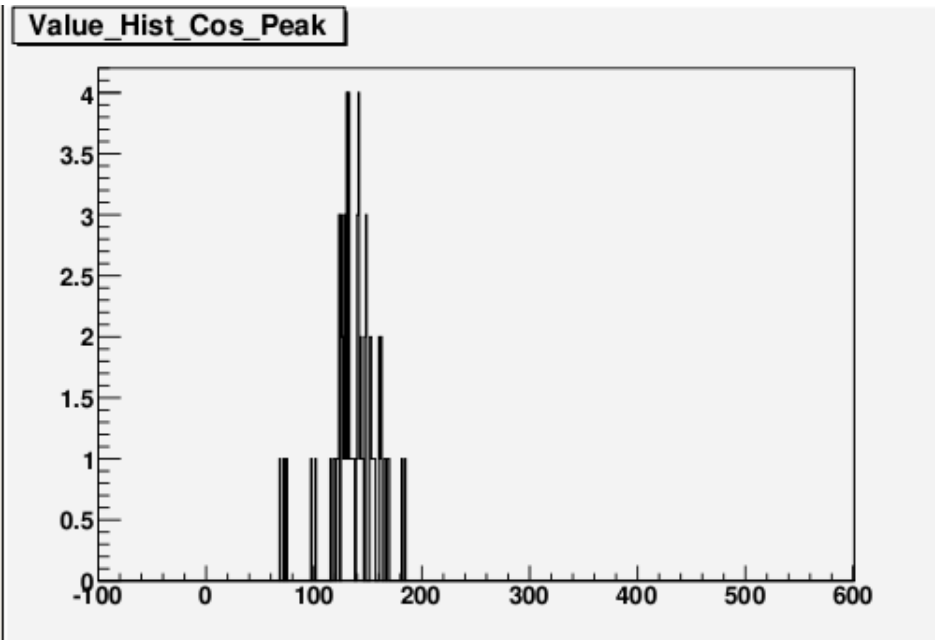
3 consecutive samples above 3 sigma
Require a peak in 3 samples
Plot of the peak value

Source Run - gimp

Cross-check: use baseline file as signal



3 consecutive samples above 3 sigma
Highest sample among the 6



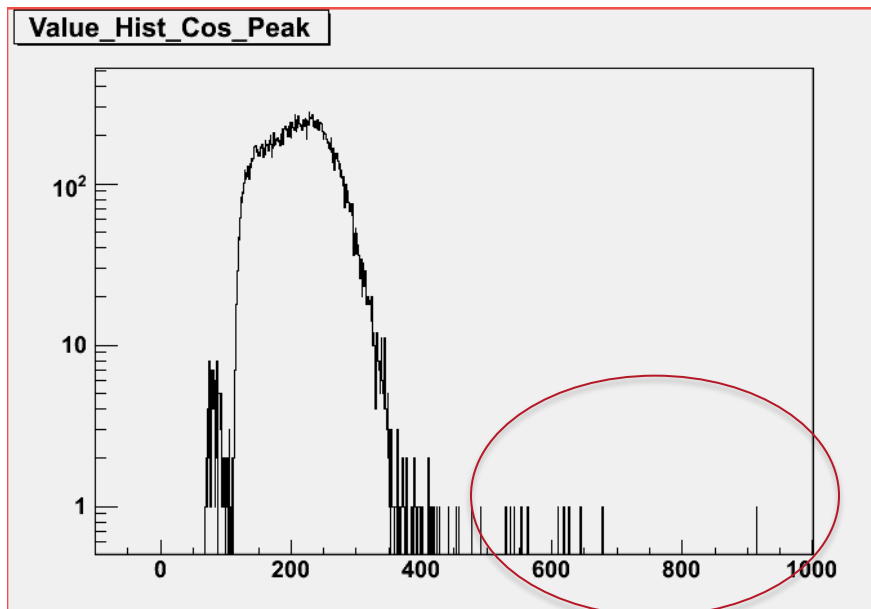
3 consecutive samples above 3 sigma
Require a peak in 3 samples
Plot of the peak value

Source Run - gimp

Can we see the 88keV line?

- Branching ratio: from 30% to 3%
- Attenuation: from 25% to 1.6% quantum efficiency (3.858 cm²/g vs. 0.215 cm²/g)
- Relative rate of 22keV/88keV $\sim 3/30 \cdot 1.6/25 = 6.4e-3$

~10min run



Questions

Look at the fitted peak values (Omar, Sho)

Looks like $1\text{keV}=10\text{ADC}$?

Is the peak width as expected? 25keV peak at 5% intensity; can we see that (noise is $\sim 3\text{keV}$)?

Estimate signal events in peak?

Can we see any signs of 88keV? Based on suppression and the signal events in 22keV peak?

How long would we need to run to get 100 88keV events?