

NPL REPORT IR 27

**Environmental Radioactivity
Proficiency Test Exercise 2011**

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JULY 2012

Environmental Radioactivity Proficiency Test Exercise 2011

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ABSTRACT

The results of NPL's seventeenth Environmental Radioactivity Proficiency Test Exercise are reported. This exercise included preparing 215 samples and distributing them to 63 participants. Seven different sample types were offered: an aqueous mixture of five alpha emitters (AL), an aqueous mixture of five alpha emitters (AH), an aqueous mixture of four beta emitters (B1), an aqueous mixture of three beta emitters and one decay by electron capture (B2), an aqueous mixture of nine gamma emitters (GL) and an aqueous mixture of seven gamma emitters (GH) and a synthetic solid sample containing six radionuclides (S). A total of 977 results were submitted, of which 80 % of the results were in agreement with the assigned values.

Assigned Values

Nuclide (AH)	Assigned Values (Bq g⁻¹)
Ra-226	3.81 ± 0.10 (± 2.6 %)
Np-237	10.94 ± 0.22 (± 2.0 %)
Pu-239	6.138 ± 0.026 (± 0.42 %)
Am-241	3.786 ± 0.016 (± 0.42 %)
Cm-244	14.63 ± 0.10 (± 0.6 %)
gross alpha	44 ± 12 (± 28 %)

Nuclide (AL)	Assigned Values (Bq kg⁻¹)
Th-232	3.76 ± 0.08 (± 2.0 %)
Np-237	17.95 ± 0.36 (± 2.0 %)
Pu-239	18.18 ± 0.08 (± 0.38 %)
Am-241	3.532 ± 0.022 (± 0.6 %)
Cm-244	10.97 ± 0.08 (± 0.8 %)
gross alpha	65 ± 10 (± 16 %)

Nuclide (B1)	Assigned Values (Bq g⁻¹)
H-3	1.493 ± 0.020 (± 1.4 %)
C-14	0.807 ± 0.014 (± 1.6 %)
Tc-99	1.633 ± 0.008 (± 0.44 %)
I-129	0.3909 ± 0.0040 (± 1.0 %)

Nuclide (B2)	Assigned Values (Bq g⁻¹)
H-3	0.3429 ± 0.0048 (± 1.4 %)
Fe-55	1.46 ± 0.06 (± 3.6 %)
Sr-90	1.613 ± 0.008 (± 0.42 %)
Pu-241	0.799 ± 0.018 (± 2.2 %)
gross beta (PC)	3.226 ± 0.014 (± 0.42 %)
gross beta (LSC)	5.83 ± 0.06 (± 1.0 %)

Nuclide (GH)	Assigned Values (Bq g⁻¹)
Co-57	0.814 ± 0.022 (± 2.8 %)
Co-58	18.54 ± 0.28 (± 1.6 %)
Co-60	18.73 ± 0.08 (± 0.42 %)
Cs-137	7.15 ± 0.14 (± 2.0 %)
Fe-59	15.07 ± 0.12 (± 0.8 %)
Mn-54	14.88 ± 0.12 (± 0.8 %)
Sb-125	2.297 ± 0.022 (± 1.0 %)

Nuclide (GL)	Assigned Values (Bq kg⁻¹)
Be-7	17.7 ± 0.6 (± 3.4 %)
Co-57	2.352 ± 0.032 (± 1.4 %)
Cs-134	6.28 ± 0.20 (± 3.0 %)
Fe-59	10.85 ± 0.22 (± 2.0 %)
K-40	16.9 ± 1.6 (± 10 %)
Na-22	11.74 ± 0.26 (± 2.2 %)
Nb-95	12.96 ± 0.22 (± 1.8 %)
Pb-210	15.31 ± 0.34 (± 2.2 %)
Zr-95	5.88 ± 0.10 (± 1.6 %)

Nuclide (S)	Assigned Values (Bq g⁻¹)
Am-241	6.8 ± 0.8 (± 12 %)
Co-60	9.1 ± 0.8 (± 8 %)
Cs-137	9.5 ± 0.8 (± 8 %)
U-234	7.8 ± 1.0 (± 12 %)
U-235	0.368 ± 0.030 (± 12 %)
U-238	7.9 ± 1.0 (± 10 %)

UNCERTAINTIES

The reported uncertainties are based on standard uncertainties multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95 %. The uncertainty evaluations have been carried out in accordance with UKAS requirements.

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ISSN 1754-2952

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Approved on behalf of NPLML by Bajram Zeqiri, Knowledge Leader AIR

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1. SUMMARY

This environmental radioactivity proficiency test exercise was the seventeenth in a series of similar exercises to have been conducted by NPL since 1989. The exercises are designed to identify analytical problems, to support UKAS accreditation and to provide a regular forum for discussion and technology transfer in this area. The exercises are now run on an annual basis by NPL. The range of sample types available for analysis has been mainly aqueous. In the 2011 exercise, seven samples types were available for analysis:

- (i) **AL**; a 'low-level' mixture of five α -emitting radionuclides
500 g of dilute nitric acid (1 – 20 Bq kg⁻¹ per radionuclide)
- (ii) **AH**; a 'high-level' mixture of five α -emitting radionuclides
20 g of dilute nitric acid (1 – 20 Bq g⁻¹ per radionuclide)
- (iv) **B1**; a mixture of four β -emitting radionuclides
500 g of very dilute NaOH solution (0.1 – 2 Bq g⁻¹ per radionuclide)
- (v) **B2**; a mixture of four β -emitting radionuclides
500 g of dilute nitric acid (0.1 – 2 Bq g⁻¹ per radionuclide)
- (vi) **GL**; a 'low-level' mixture of nine γ -emitting radionuclides
500 g of dilute hydrochloric acid (1 – 20 Bq kg⁻¹ per radionuclide)
- (vii) **GH**; a 'high-level' mixture of seven γ -emitting radionuclides
100 g of dilute hydrochloric acid (1 – 20 Bq g⁻¹ per radionuclide)
- (viii) **S**; a solid SiO₂ sample containing six radionuclides
50 g (0.1 – 20 Bq g⁻¹ per radionuclide)

As in previous years, the principal objective was to assess the performance of the participating laboratories. This required the participants to identify and/or traceably quantify the activity levels of radionuclides present in the samples, whereas the tasks of NPL were to prepare and distribute the samples to the participating laboratories, to collect, analyse and interpret the results and to compile an exercise report.

The assigned activity concentration values of all the radionuclide solutions were traceable to national standards of radioactivity. The traceability to national standards in turn provides traceability at an international level to the ultimate reference point of all measurements, the SI reference value maintained by the Bureau International des Poids et Mesures (BIPM).

The data treatment was similar compared to the previous 2010 exercise. A result was only classified as 'in agreement' when three tests (the zeta test, the relative uncertainty outlier test and the z-test) were passed. A failure to pass one of these tests resulted in a classification 'questionable'. Failure of both the zeta test and the z-test resulted in a classification 'discrepant'.

2. TREATMENT OF DATA

The laboratory data were reported back to the participants in order for the participants to check for gross errors. The deviation from the assigned (NPL) value for each laboratory value is given by:

$$D = \frac{L - N}{N} = \left(\frac{L}{N} - 1 \right) \quad [1]$$

The error bars in the graphs represent the standard uncertainty ($k=1$) of the deviation:

$$u_D = \frac{L}{N} \sqrt{\left(\frac{u_L}{L} \right)^2 + \left(\frac{u_N}{N} \right)^2} \quad [2]$$

The results were evaluated by three tests:

$$\zeta = \frac{L - N}{\sqrt{u_L^2 + u_N^2}} \quad [3]$$

$$R_L = \frac{u_L}{L} \quad [4]$$

$$z = \frac{L - N}{\sigma_p} = \frac{L - N}{0.05823 N} \quad [5]$$

where:

D	– deviation from the assigned value
L	– laboratory value
N	– assigned value
u_D	– standard uncertainty of the deviation
u_L	– standard uncertainty of the laboratory value
u_N	– standard uncertainty of the assigned value
ζ	– zeta score
R_L	– relative uncertainty of the laboratory value
z	– z-score
σ_p	– standard uncertainty for proficiency assessment

unit:

(Bq kg⁻¹ or Bq g⁻¹)
(Bq kg⁻¹ or Bq g⁻¹)

(Bq kg⁻¹ or Bq g⁻¹)
(Bq kg⁻¹ or Bq g⁻¹)

(Bq kg⁻¹ or Bq g⁻¹)

The zeta and z-scores were used to determine whether the difference between the laboratory value and the assigned value were significantly different from zero. The Interquartile Range (IQR) outlier test (see NPL Report IR 26 for details) was used to determine whether the relative uncertainty of the laboratory value R_L was significantly larger than the other values in the data set. This test is unable to identify outliers if the data set is smaller than 7.

Results for which the absolute values of the zeta score and the z-score are both ≤ 2.576 (corresponding to a significance levels of $\alpha = 0.01$) and for which the relative uncertainty R_L is not significantly larger than the other values in the data set is taken to mean that the laboratory value is 'in agreement' (dark blue points). If either (i) the relative uncertainty R_L is significantly larger than the other values in the data set, (ii) the result passes the zeta test but not the z-test (i.e., there is a large deviation from the assigned value combined with a large uncertainty), or (iii) the result passes the z-test but not the zeta test (where there is a small deviation from the assigned value and a small uncertainty), the laboratory value is classified as 'questionable' (yellow points). If the absolute values of both the zeta score and the z-score > 2.576 , then the laboratory value is classified as 'discrepant' from the assigned value (red points), whatever the value of its relative uncertainty R_L . The factor of 0.05823 used to calculate the z-score is the ratio between 0.15 (i.e. a deviation of 15%) and 2.576. In other words, a deviation D with an absolute value of $\leq 15\%$ will suffice to pass the z-score.

zeta test	R_L test	z test	Classification
pass	pass	pass	in agreement
pass	fail	pass	questionable
fail	pass	pass	questionable
pass	-	fail	questionable
fail	-	fail	discrepant

3. SUMMARY OF PARTICIPANTS RESULTS

The means and the uncertainties for the participants' results of the aqueous samples were calculated in accordance with the method described in NPL Report IR 26 (Environmental Radioactivity Proficiency Test Exercise 2010) and subsequently compared with the assigned values.

Nuclide (AL)	NPL Assigned Values (Bq kg ⁻¹)	WM LCS (Bq kg ⁻¹)	Deviation %	zeta	Critical Value
Th-232	3.76 ± 0.08 (± 2.0 %)	3.58 ± 0.10 (± 2.8 %)	-5.0	-2.97	2.90
Np-237	17.95 ± 0.36 (± 2.0 %)	16.8 ± 0.8 (± 4.4 %)	-6.2	-2.75	3.01
Pu-239	18.18 ± 0.08 (± 0.38 %)	17.92 ± 0.30 (± 1.8 %)	-1.5	-1.70	2.90
Am-241	3.532 ± 0.022 (± 0.6 %)	3.44 ± 0.08 (± 2.0 %)	-2.5	-2.44	2.81
Cm-244	10.97 ± 0.08 (± 0.8 %)	10.70 ± 0.34 (± 3.2 %)	-2.4	-1.57	3.17
gross α	65 ± 10 (± 16 %)	67.7 ± 1.6 (± 2.4 %)	4.6	0.61	2.58

Nuclide (AH)	NPL Assigned Values (Bq g ⁻¹)	WM LCS (Bq g ⁻¹)	Deviation %	zeta	Critical Value
Ra-226	3.81 ± 0.10 (± 2.6 %)	3.52 ± 0.10 (± 2.8 %)	-7.7	-4.21	2.70
Np-237	10.94 ± 0.22 (± 2.0 %)	11.60 ± 0.34 (± 2.9 %)	6.1	3.28	3.11
Pu-239	6.138 ± 0.026 (± 0.42 %)	6.04 ± 0.14 (± 2.3 %)	-1.6	-1.46	3.11
Am-241	3.786 ± 0.016 (± 0.42 %)	3.76 ± 0.08 (± 2.1 %)	-0.6	-0.50	2.95
Cm-244	14.63 ± 0.10 (± 0.6 %)	13.72 ± 0.50 (± 3.6 %)	-6.2	-3.59	3.50
gross α	44 ± 12 (± 28 %)	43.8 ± 1.0 (± 2.3 %)	0.4	0.03	2.58

Nuclide (B1)	NPL Assigned Values (Bq g ⁻¹)	WM LCS (Bq g ⁻¹)	Deviation %	zeta	Critical Value
H-3	1.493 ± 0.020 (± 1.4 %)	1.499 ± 0.026 (± 1.7 %)	0.4	0.38	2.65
C-14	0.807 ± 0.014 (± 1.6 %)	0.794 ± 0.022 (± 2.8 %)	-1.7	-1.03	2.80
Tc-99	1.633 ± 0.008 (± 0.44 %)	1.592 ± 0.046 (± 2.9 %)	-2.5	-1.73	3.01
I-129	0.3909 ± 0.0040 (± 1.0 %)	0.398 ± 0.022 (± 5.5 %)	1.8	0.65	4.03

Nuclide (B2)	NPL Assigned Values (Bq g ⁻¹)	WM LCS (Bq g ⁻¹)	Deviation %	zeta	Critical Value
H-3	0.3429 ± 0.0048 (± 1.4 %)	0.343 ± 0.006 (± 1.7 %)	0.1	0.05	2.65
Fe-55	1.46 ± 0.06 (± 3.6 %)	1.40 ± 0.06 (± 4.3 %)	-3.9	-1.51	2.71
Sr-90	1.613 ± 0.008 (± 0.42 %)	1.572 ± 0.032 (± 2.0 %)	-2.6	-2.50	2.85
Pu-241	0.799 ± 0.018 (± 2.2 %)	0.868 ± 0.028 (± 3.2 %)	8.7	4.30	2.80

Nuclide (GH)	NPL Assigned Values (Bq g ⁻¹)	WM LCS (Bq g ⁻¹)	Deviation %	zeta	Critical Value
Co-57	0.814 ± 0.022 (± 2.8 %)	0.847 ± 0.014 (± 1.7 %)	4.1	2.62	2.59
Co-58	18.54 ± 0.28 (± 1.6 %)	18.31 ± 0.14 (± 0.8 %)	-1.3	-1.46	2.58
Co-60	18.73 ± 0.08 (± 0.42 %)	18.51 ± 0.22 (± 1.2 %)	-1.1	-1.79	2.73
Cs-137	7.15 ± 0.14 (± 2.0 %)	7.305 ± 0.048 (± 0.7 %)	2.1	2.01	2.58
Fe-59	15.07 ± 0.12 (± 0.8 %)	15.29 ± 0.20 (± 1.3 %)	1.4	1.85	2.67
Mn-54	14.88 ± 0.12 (± 0.8 %)	14.97 ± 0.18 (± 1.2 %)	0.6	0.87	2.68
Sb-125	2.297 ± 0.022 (± 1.0 %)	2.271 ± 0.040 (± 1.8 %)	-1.1	-1.17	2.68

Nuclide (GL)	NPL Assigned Values (Bq kg ⁻¹)	WM LCS (Bq kg ⁻¹)	Deviation %	zeta	Critical Value
Be-7	17.7 ± 0.6 (± 3.4 %)	17.4 ± 0.6 (± 3.5 %)	-2.0	-0.91	2.60
Co-57	2.352 ± 0.032 (± 1.4 %)	2.328 ± 0.046 (± 2.0 %)	-1.0	-0.87	2.63
Cs-134	6.28 ± 0.20 (± 3 %)	6.09 ± 0.10 (± 1.6 %)	-3.0	-1.77	2.58
Fe-59	10.85 ± 0.22 (± 2.0 %)	11.44 ± 0.24 (± 2.1 %)	5.5	3.66	2.61
K-40	16.9 ± 1.6 (± 10 %)	15.9 ± 0.8 (± 5.0 %)	-5.8	-1.16	2.58
Na-22	11.74 ± 0.26 (± 2.2 %)	10.98 ± 0.18 (± 1.6 %)	-6.5	-4.94	2.59
Nb-95	12.96 ± 0.22 (± 1.8 %)	13.11 ± 0.30 (± 2.3 %)	1.1	0.80	2.64
Pb-210	15.31 ± 0.34 (± 2.2 %)	16.0 ± 0.8 (± 5 %)	4.7	1.59	2.86
Zr-95	5.88 ± 0.10 (± 1.6 %)	5.83 ± 0.14 (± 2.4 %)	-0.8	-0.63	2.63

Nuclide (S)	NPL (Bq g ⁻¹)	Assigned Values WM LCS (Bq g ⁻¹)	Deviation %
Am-241	6.8 ± 0.6 (± 10 %)	6.8 ± 0.8 (± 10 %)	0.0
Co-60	9.8 ± 0.8 (± 8 %)	9.1 ± 0.8 (± 8 %)	-6.5
Cs-137	10.0 ± 0.8 (± 8 %)	9.5 ± 0.8 (± 8 %)	-5.2
U-234	8.2 ± 1.0 (± 12 %)	7.8 ± 1.0 (± 12 %)	-4.6
U-235	0.390 ± 0.032 (± 8 %)	0.368 ± 0.030 (± 8 %)	-5.8
U-238	8.2 ± 1.0 (± 12 %)	7.9 ± 1.0 (± 12 %)	-3.6

4. SUMMARY RESULTS BY NUCLIDE

Nuclide	In Agreement	Questionable	Discrepant	Total
Am-241(S)	16	1	5	22
Co-60(S)	19	1	1	21
Cs-137(S)	18	0	2	20
U-234	12	2	3	17
U-235	12	3	8	23
U-238	16	1	3	20
Co-57(GH)	24	1	0	25
Co-58	29	1	0	30
Co-60(GH)	26	6	0	32
Cs-137(GH)	29	3	0	32
Fe-59(GH)	24	6	0	30
Mn-54	27	4	0	31
Sb-125	28	2	0	30
Be-7	35	3	1	39
Co-57(GL)	40	2	0	42
Cs-134	40	3	1	44
Fe-59(GL)	34	6	1	41
K-40	21	7	2	30
Na-22	27	10	5	42
Nb-95	28	4	9	41
Pb-210	11	4	1	16
Zr-95	38	4	1	43
H-3(B1)	25	3	1	29
C-14	11	3	2	16
Tc-99	13	0	2	15
I-129	5	1	3	9
H-3(B2)	20	1	8	29
Fe-55	9	3	1	13
Sr-90	17	3	1	21
Pu-241	8	5	1	14
gross β	2	1	0	3
Th-232	8	1	6	15
Np-237(AL)	7	2	2	11
Pu-239(AL)	17	0	1	18
Am-241(AL)	20	1	1	22
Cm-244(AL)	8	2	3	13
gross α (AL)	2	2	1	5
Ra-226	8	4	2	14
Np-237(AH)	6	1	0	7
Pu-239(AH)	11	1	1	13
Am-241(AH)	14	2	0	16
Cm-244(AH)	6	3	1	10
gross α (AH)	8	0	1	9
Total	777	114	81	972

5. SUMMARY RESULTS IN ORDER OF PERCENTAGE IN AGREEMENT

Nuclide	In Agreement %	Questionable %	Discrepant %
Co-58	97	3	0
Co-57(GL)	95	5	0
Pu-239(AL)	94	0	6
Sb-125	93	7	0
Co-57(GH)	92	8	0
Cs-134	91	7	2
Am-241(AL)	91	5	5
Cs-137(GH)	91	9	0
Co-60(S)	90	5	5
Cs-137(S)	90	0	10
Be-7	90	8	3
gross α (AH)	89	0	11
Zr-95	88	9	2
Am-241(AH)	88	13	0
Mn-54	87	13	0
Tc-99	87	0	13
H-3(B1)	86	10	3
Np-237(AH)	86	14	0
Pu-239(AH)	85	8	8
Fe-59(GL)	83	15	2
Sr-90	82	14	5
Co-60(GH)	81	19	0
Fe-59(GH)	80	20	0
U-238	80	5	15
Am-241(S)	73	5	23
U-234	71	12	18
K-40	70	23	7
Fe-55	69	23	8
H-3(B2)	69	3	28
C-14	69	19	13
Pb-210	69	25	6
Nb-95	68	10	22
gross β (B2)	67	33	0
Na-22	64	24	12
Np-237(AL)	64	18	18
Cm-244(AL)	62	15	23
Cm-244(AH)	60	30	10
Ra-226	57	29	14
Pu-241	57	36	7
I-129	56	11	33
Th-232	53	7	40
U-235	52	13	35
gross α (AL)	40	40	20
Total	80	12	8

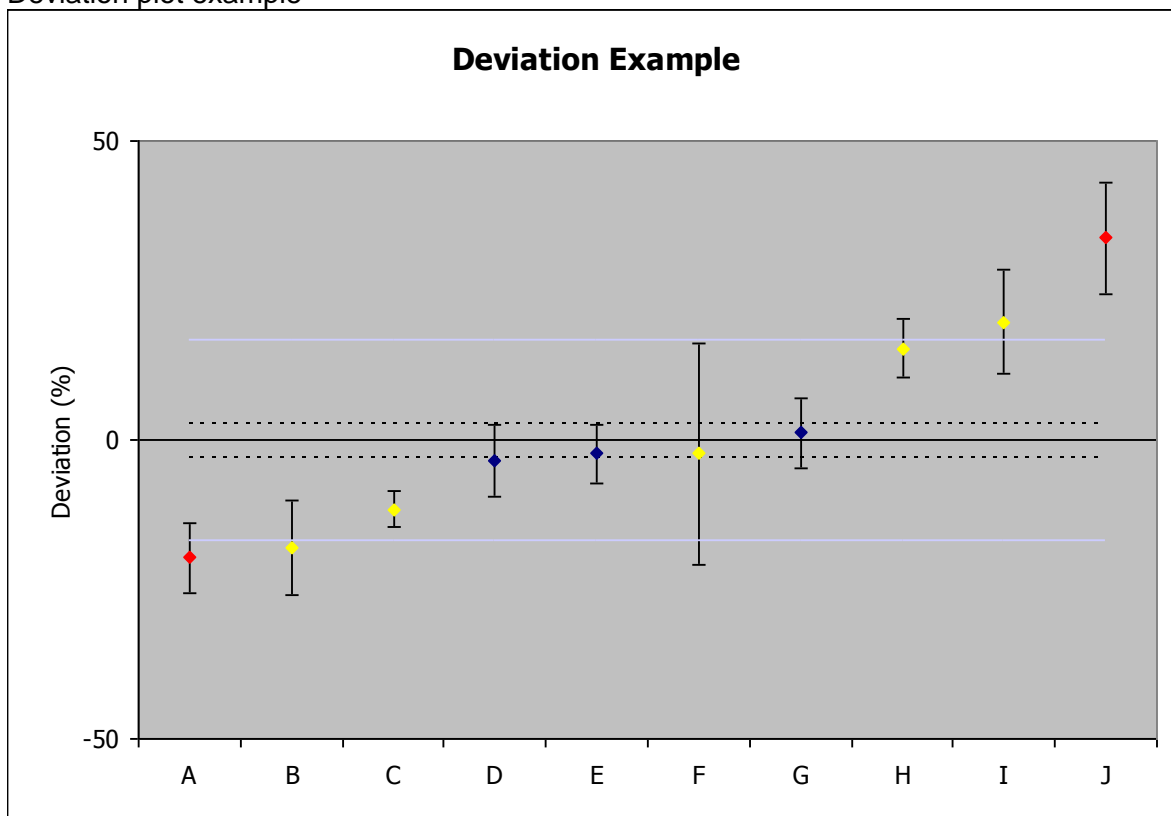
6. SUMMARY OF OUTLIER TEST RESULTS

Nuclide	Uncertainty Outlier %	Total Number of Outliers	Lab Number
Am-241(S)	21	1	95
Co-60(S)	13		
Cs-137(S)	18		
U-234	44		
U-235	28	1	1
U-238	24		
Co-57(GH)	26		
Co-58	25		
Co-60(GH)	23		
Cs-137(GH)	20		
Fe-59(GH)	23	1	1
Mn-54	24		
Sb-125	25		
Be-7	36	1	138
Co-57(GL)	29	1	138
Cs-134	28	1	138
Fe-59(GL)	23	2	129, 138
K-40	38	1	138
Na-22	25	1	138
Nb-95	24	1	138
Pb-210	41		
Zr-95	24	2	40, 138
H-3(B1)	30		
C-14	34		
Tc-99	15		
I-129	21		
H-3(B2)	26		
Fe-55	27	1	31
Sr-90	24	1	31
Pu-241	27	1	7
gross β (B2)I	N/A		
Th-232	24	1	8
Np-237(AL)	39		
Pu-239(AL)	23		
Am-241(AL)	29		
Cm-244(AL)	26		
gross α (AL)	N/A		
Ra-226	31	1	8
Np-237(AH)	51		
Pu-239(AH)	19		
Am-241(AH)	20		
Cm-244(AH)	13	1	7
gross α (AH)	N/A		

7. DATA CLASSIFICATION

Deviations D for results 'in agreement' are represented by the dark blue points. Questionable and discrepant results are represented by the yellow and red points, respectively. The error bars represent the standard uncertainties u_D (with a coverage factor of $k=1$). The light blue lines represent z-scores of -2.576 and 2.576 (-15% or $+15\%$ deviation). The dashed line represents the standard uncertainty of the assigned value.

Deviation plot example

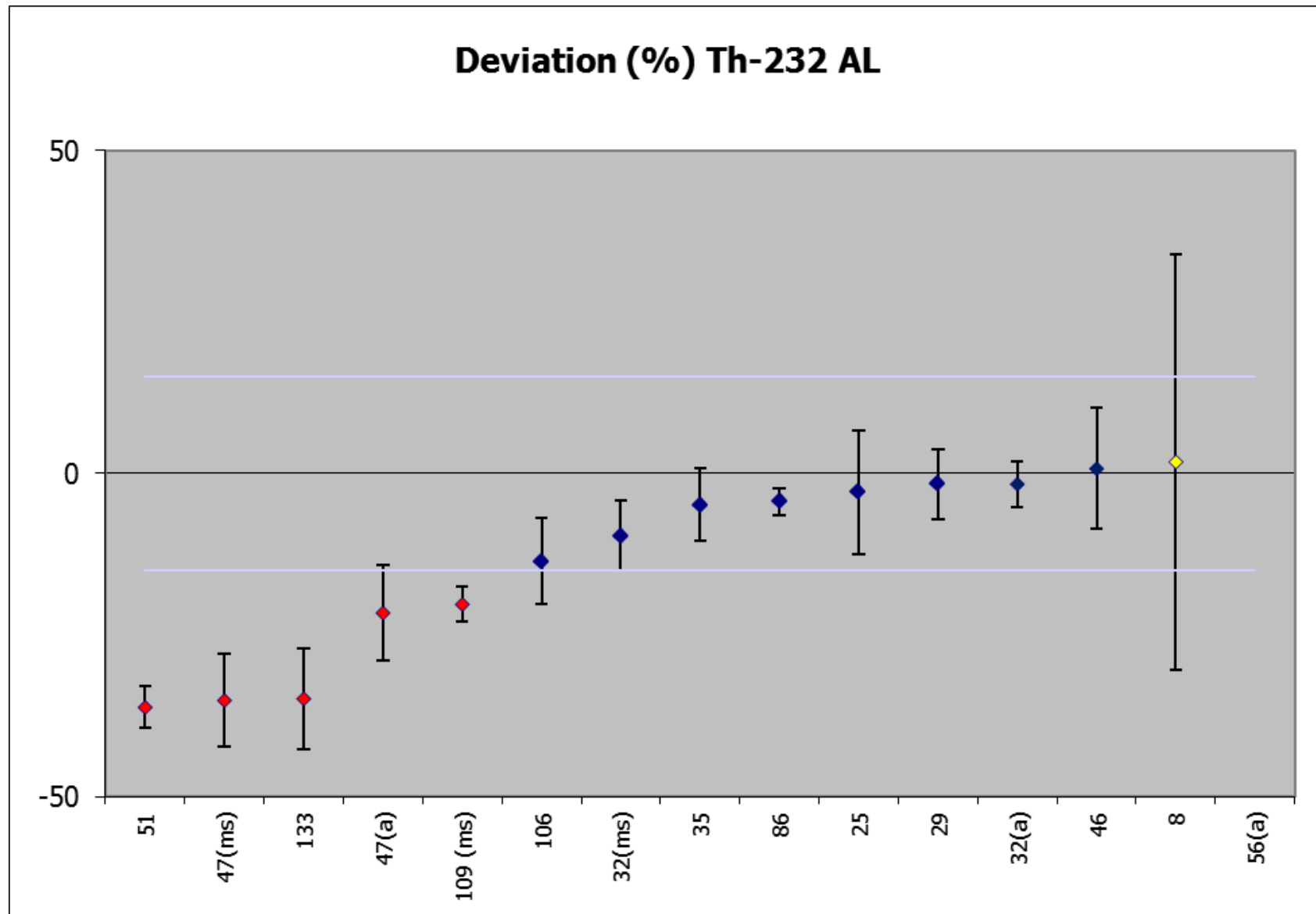


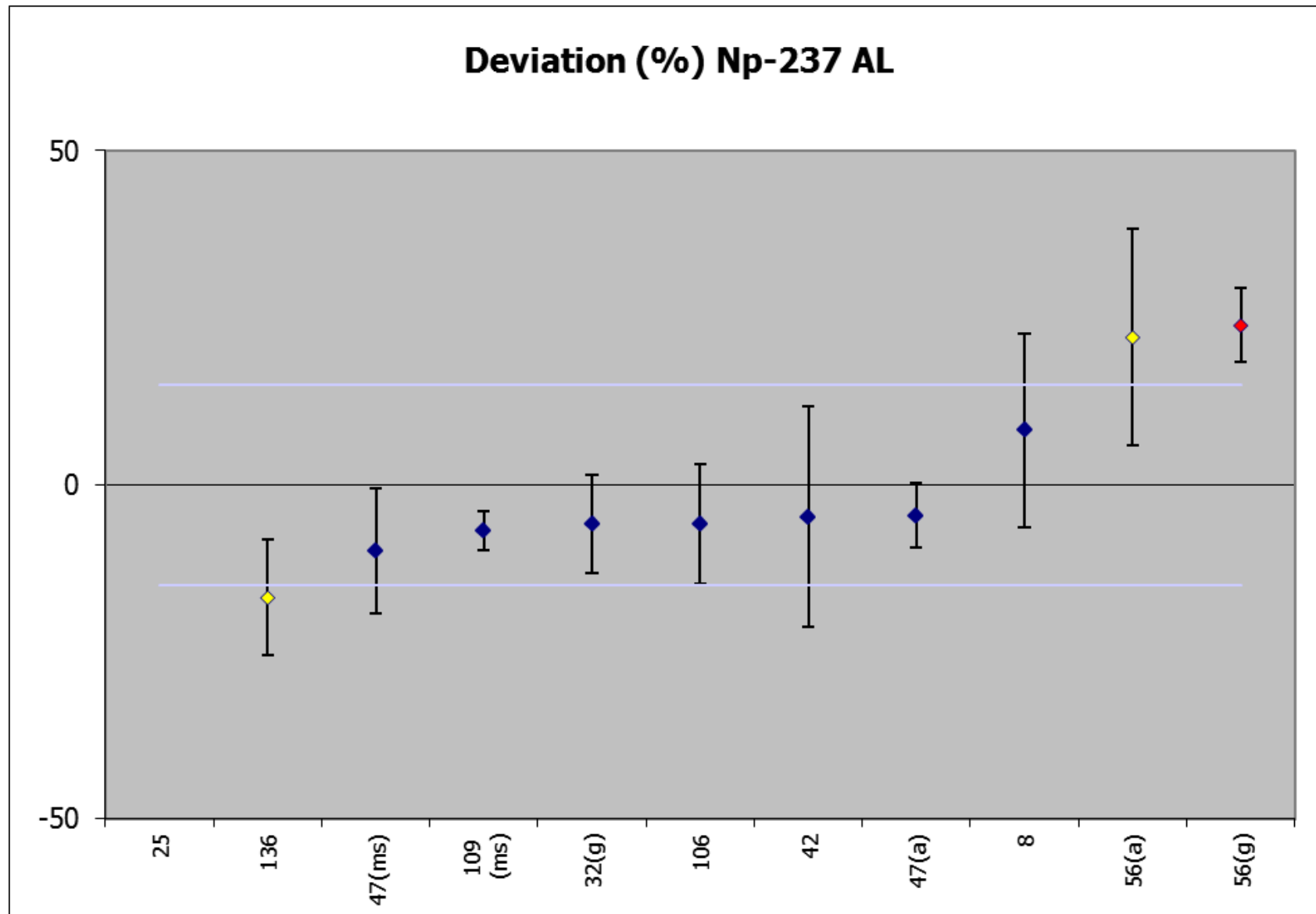
Data classification

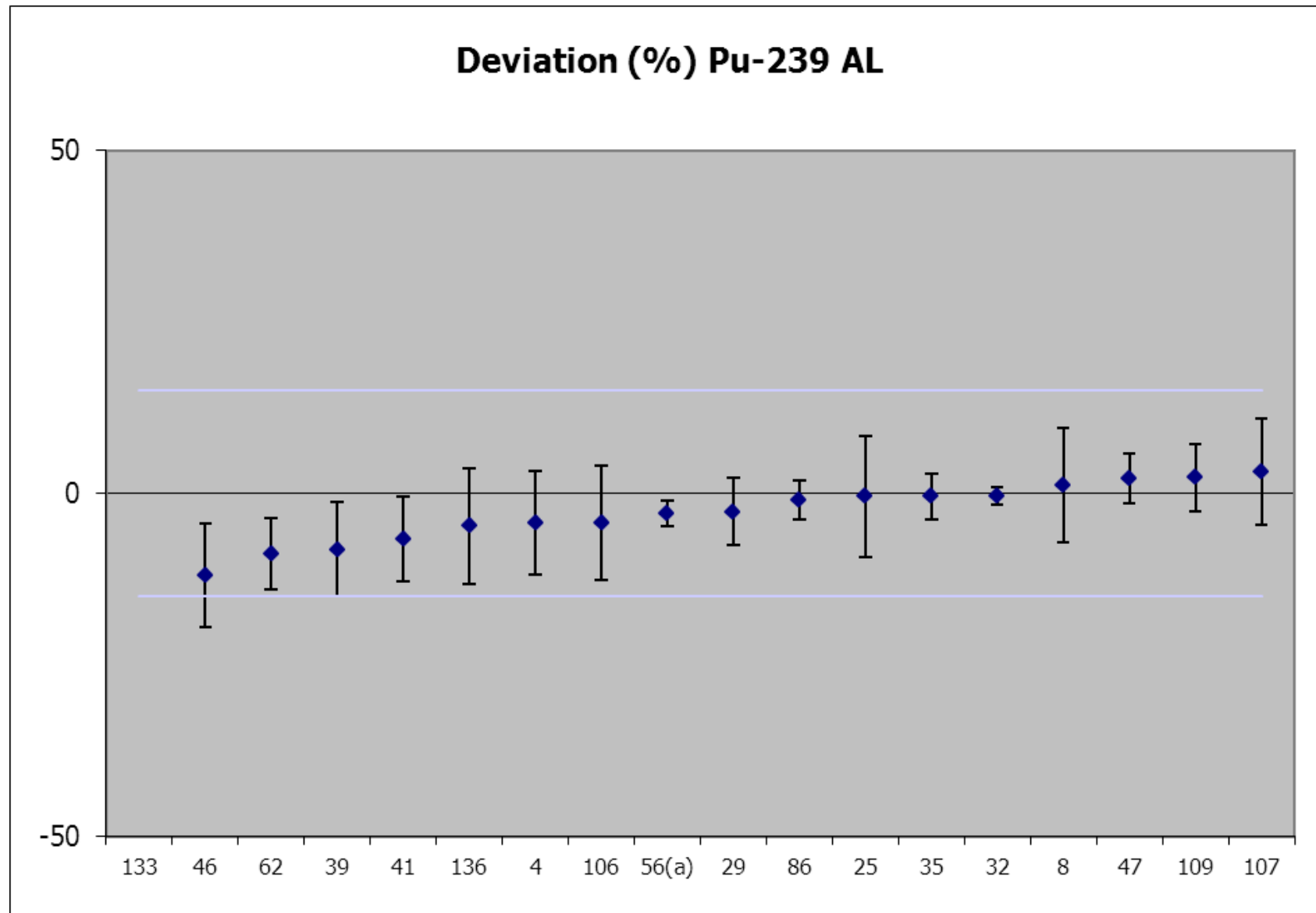
Lab	Zeta test	R_L outlier test	z test	Verdict
A	fail	pass	fail	discrepant
B	pass	pass	fail	questionable
C	fail	pass	pass	questionable
D	pass	pass	pass	in agreement
E	pass	pass	pass	in agreement
F	pass	fail	pass	questionable
G	pass	pass	pass	in agreement
H	fail	pass	pass	questionable
I	pass	pass	fail	questionable
J	fail	pass	fail	discrepant

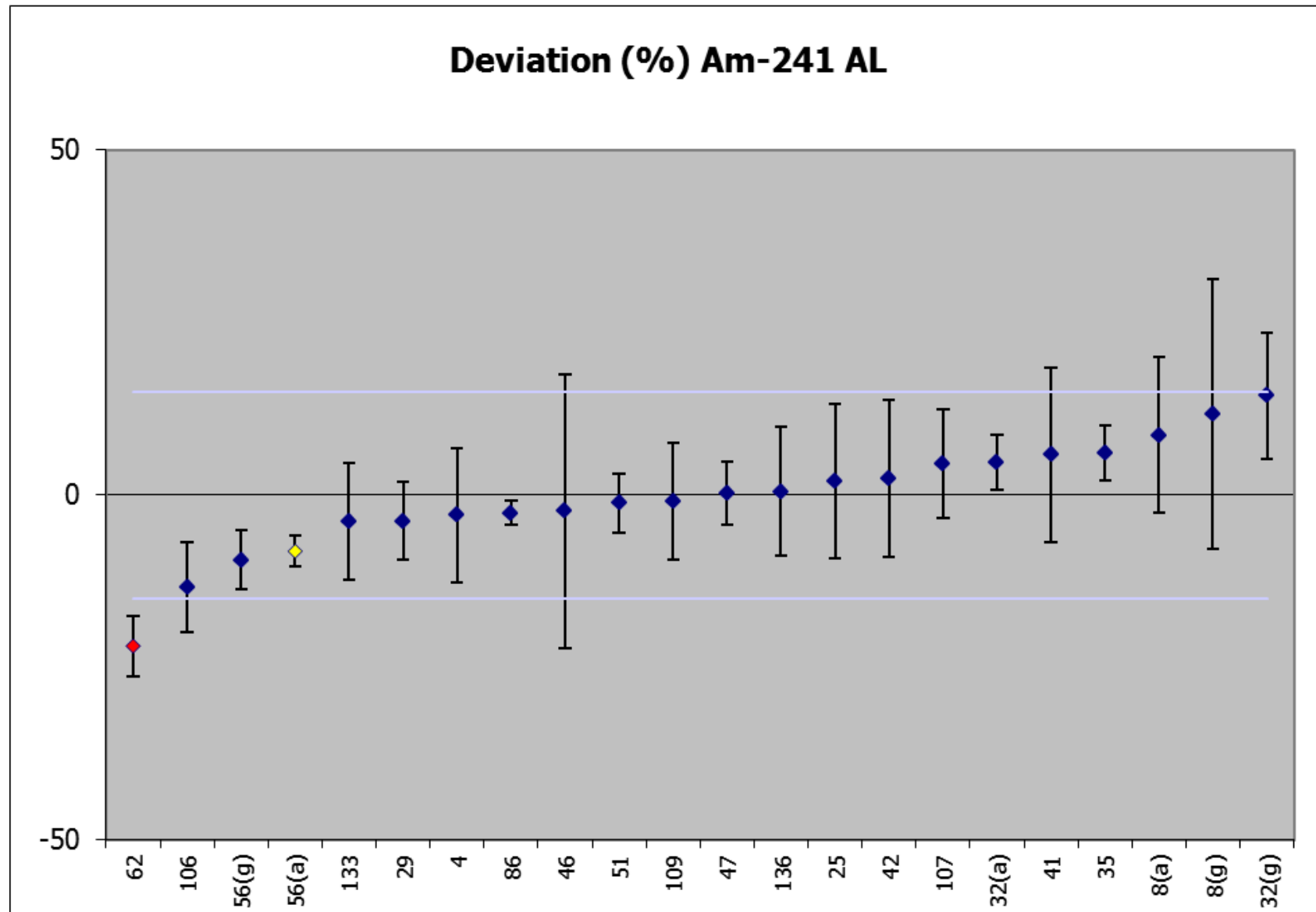
Alpha Low (AL) Deviation Plots

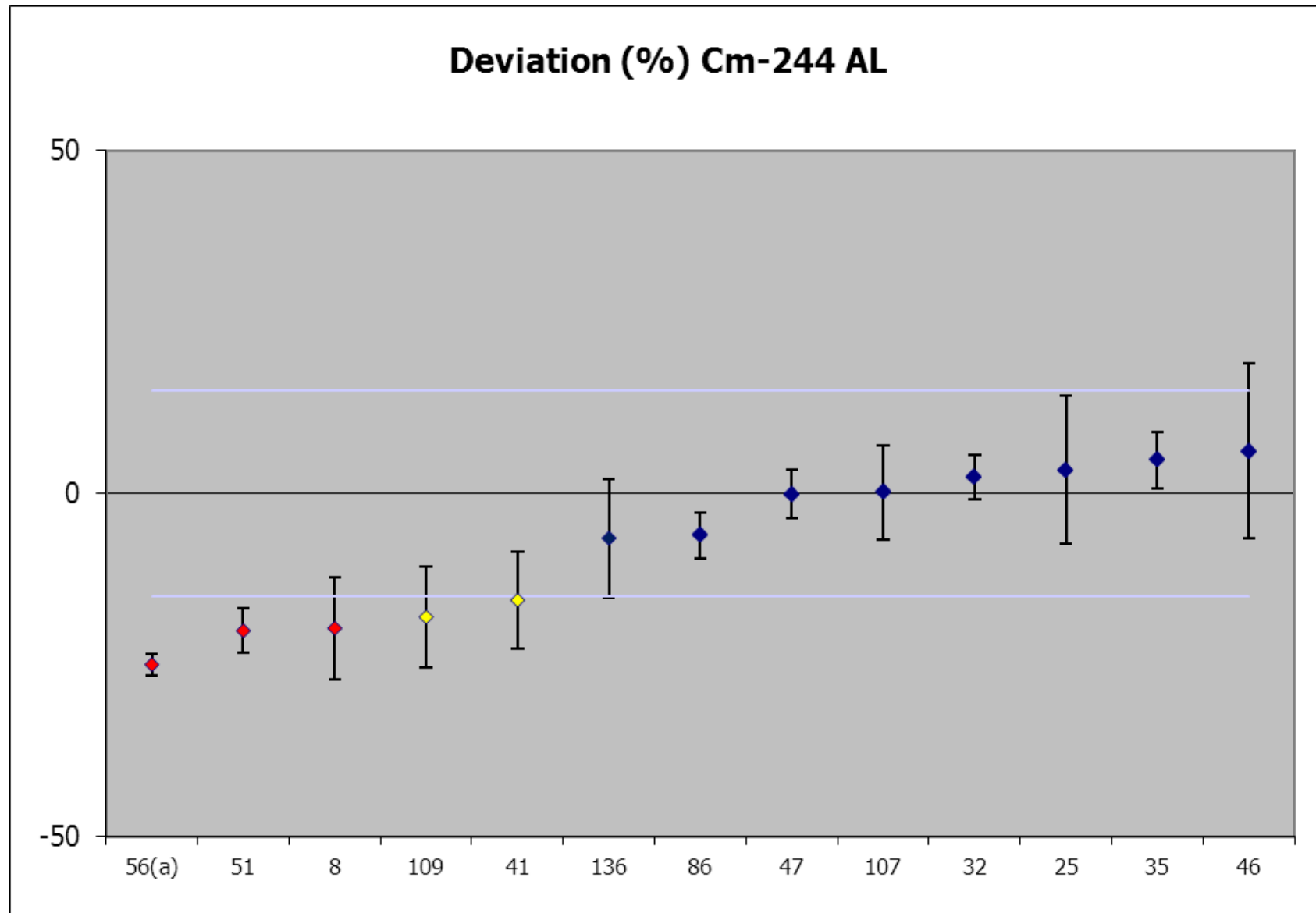
a = alpha spectrometry
g = gamma spectrometry
ms = mass spectrometry

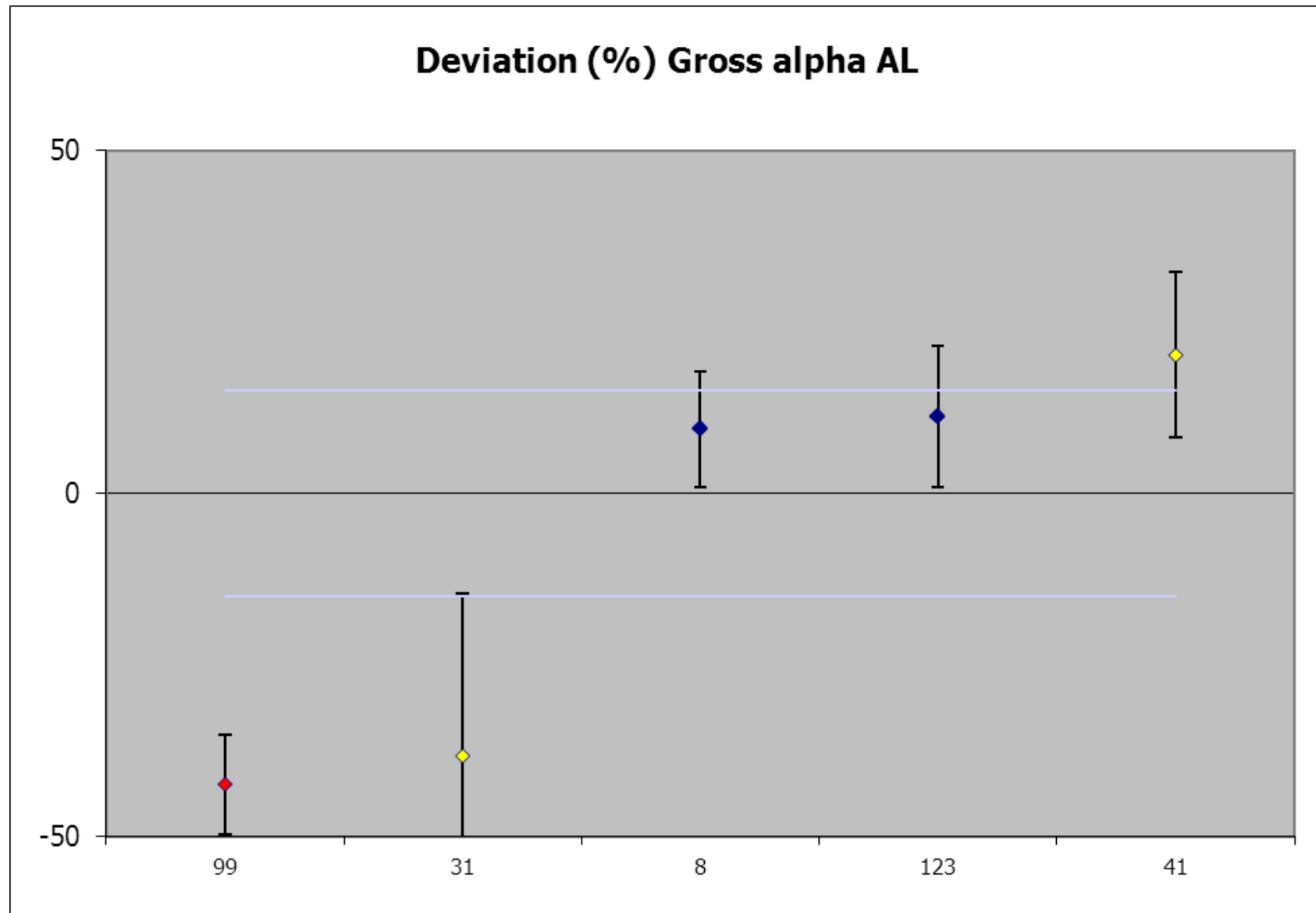






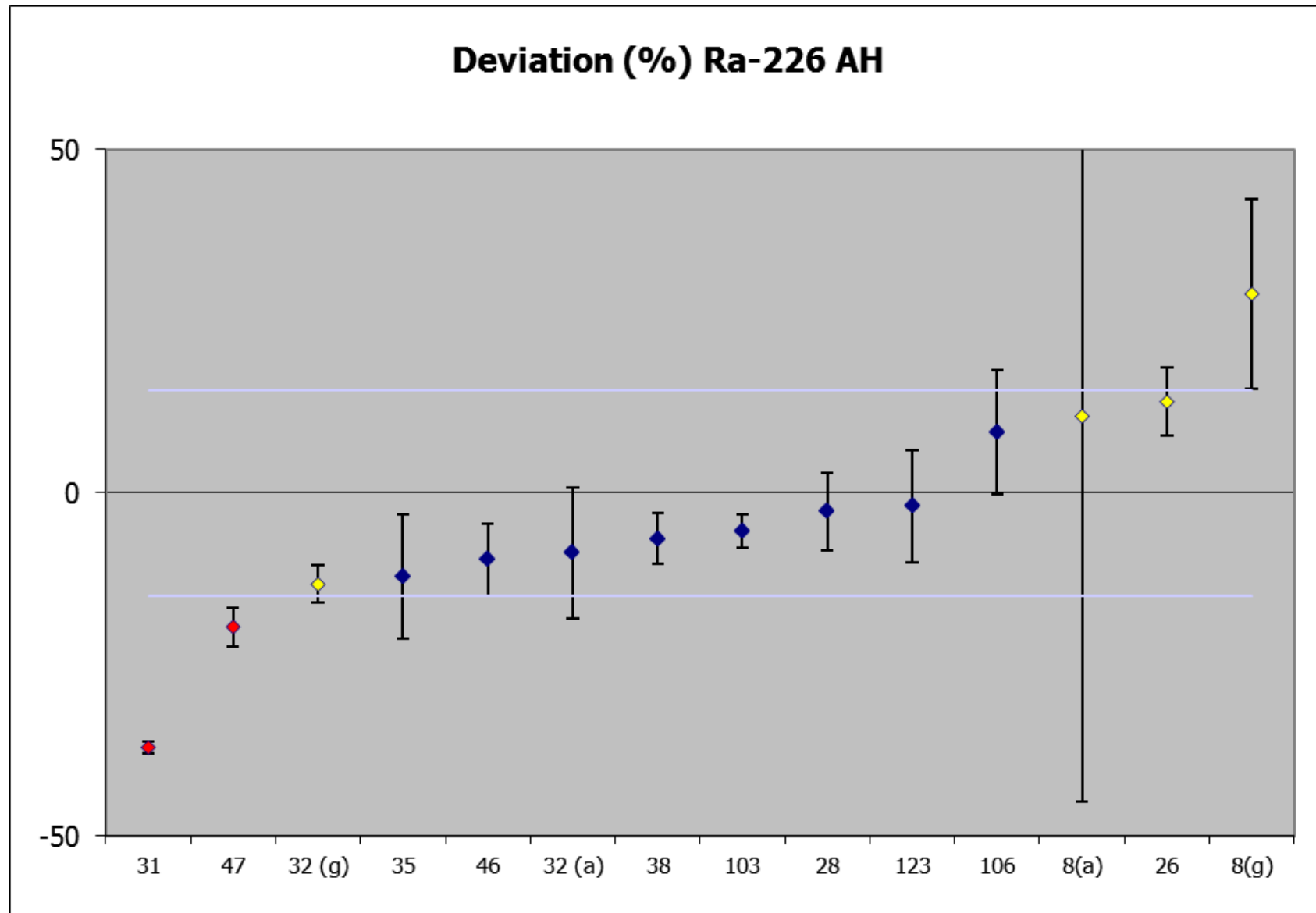


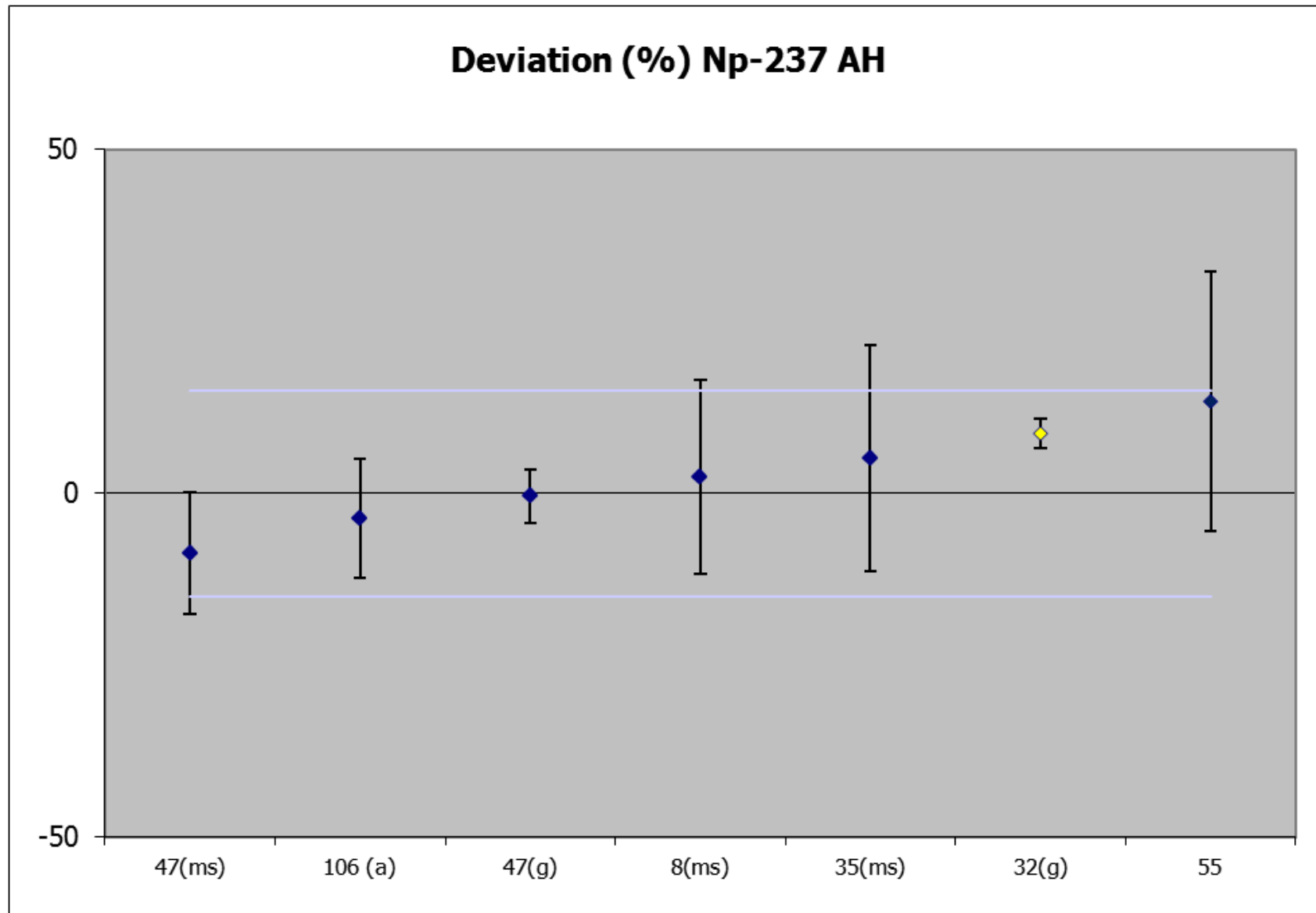


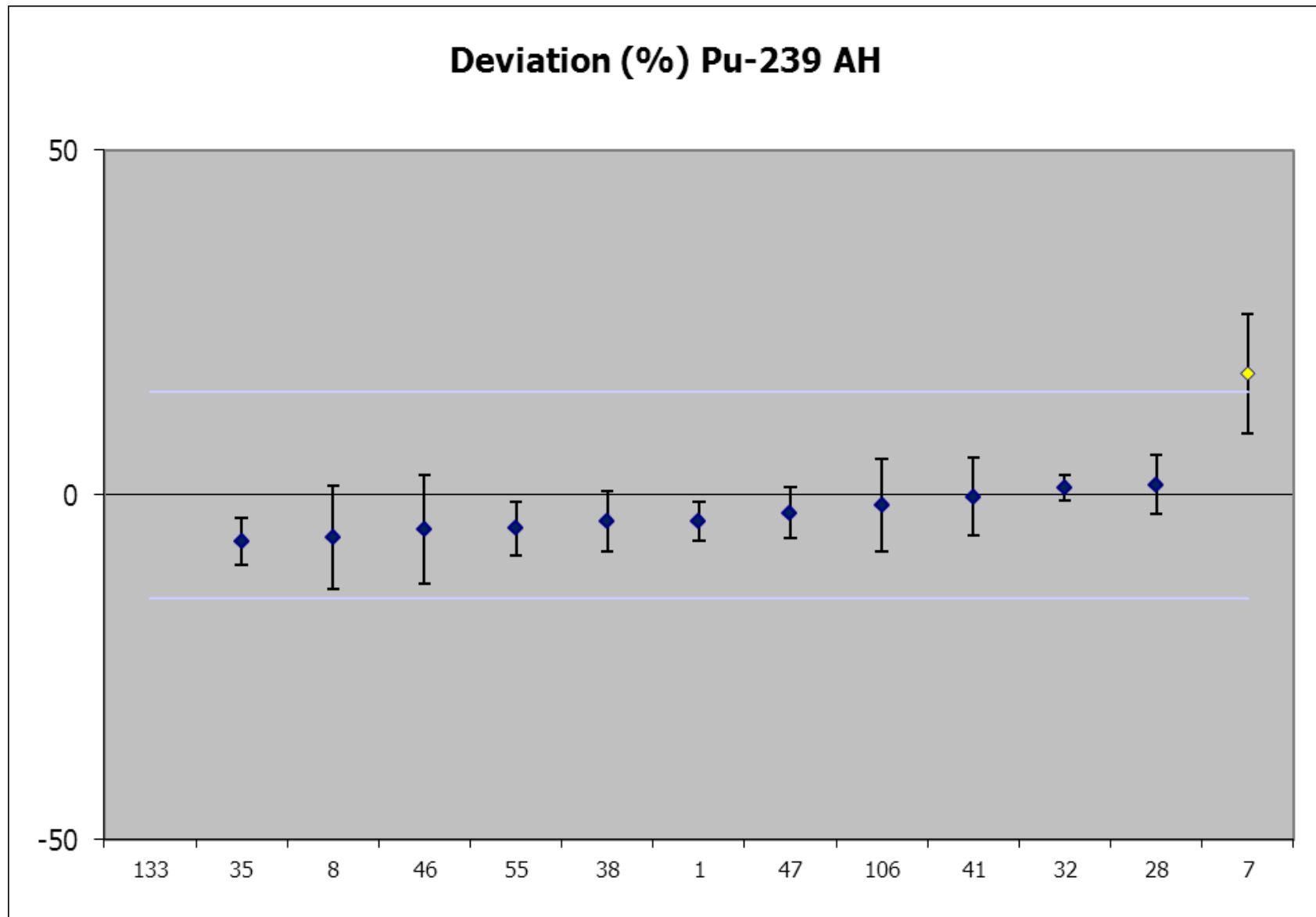


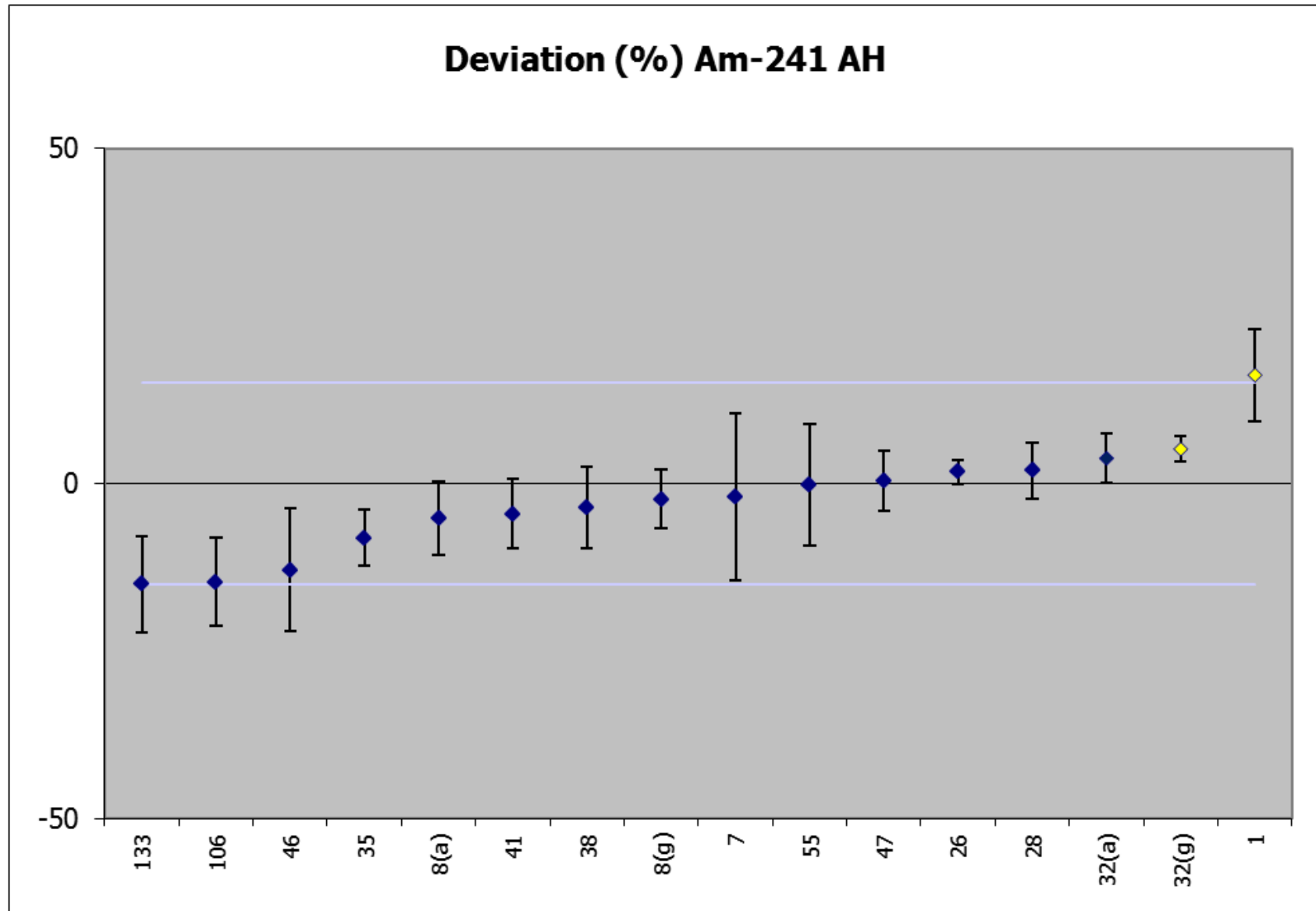
Alpha High (AH) Deviation Plots

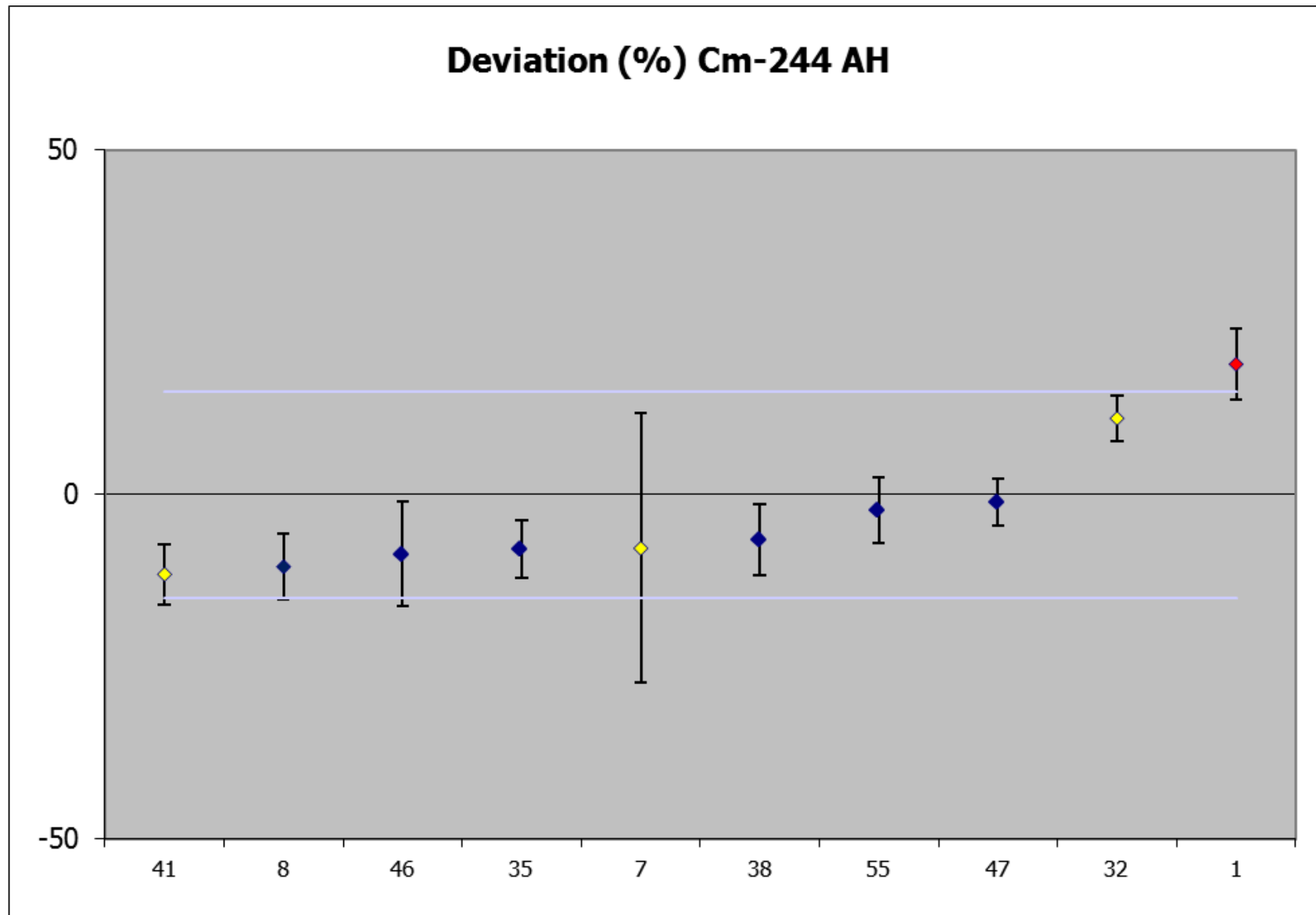
a = alpha spectrometry
g = gamma spectrometry
ms = mass spectrometry

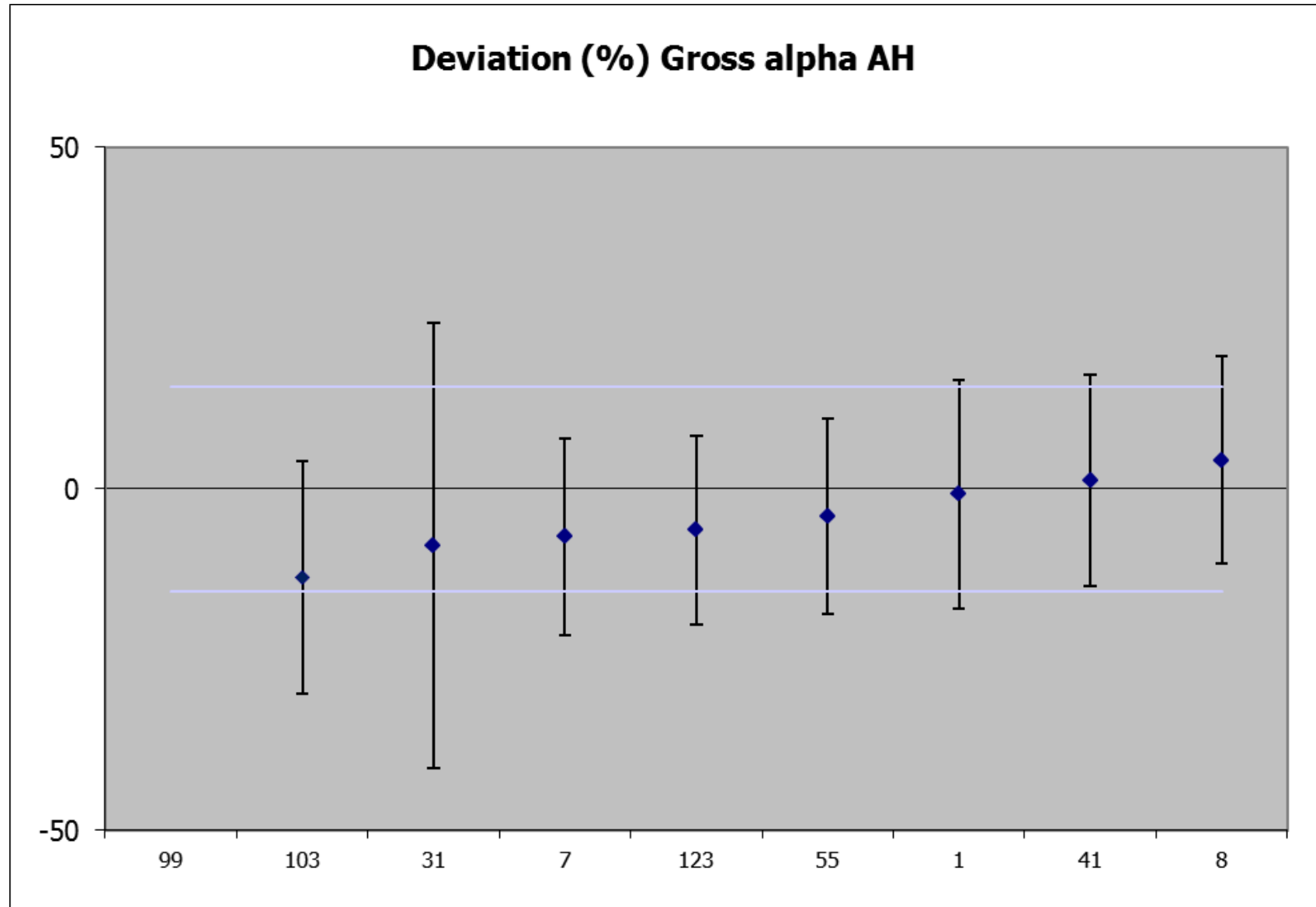








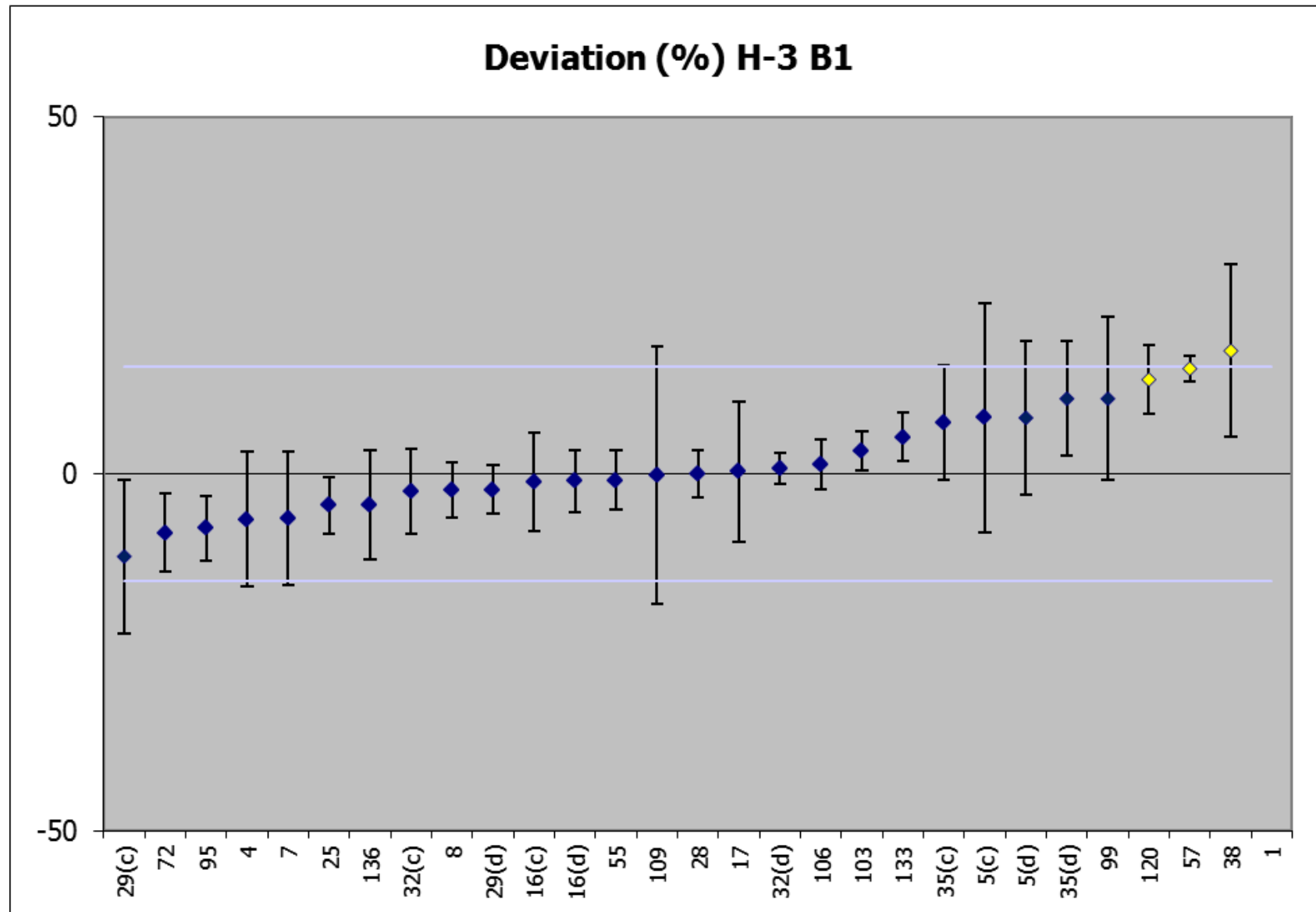


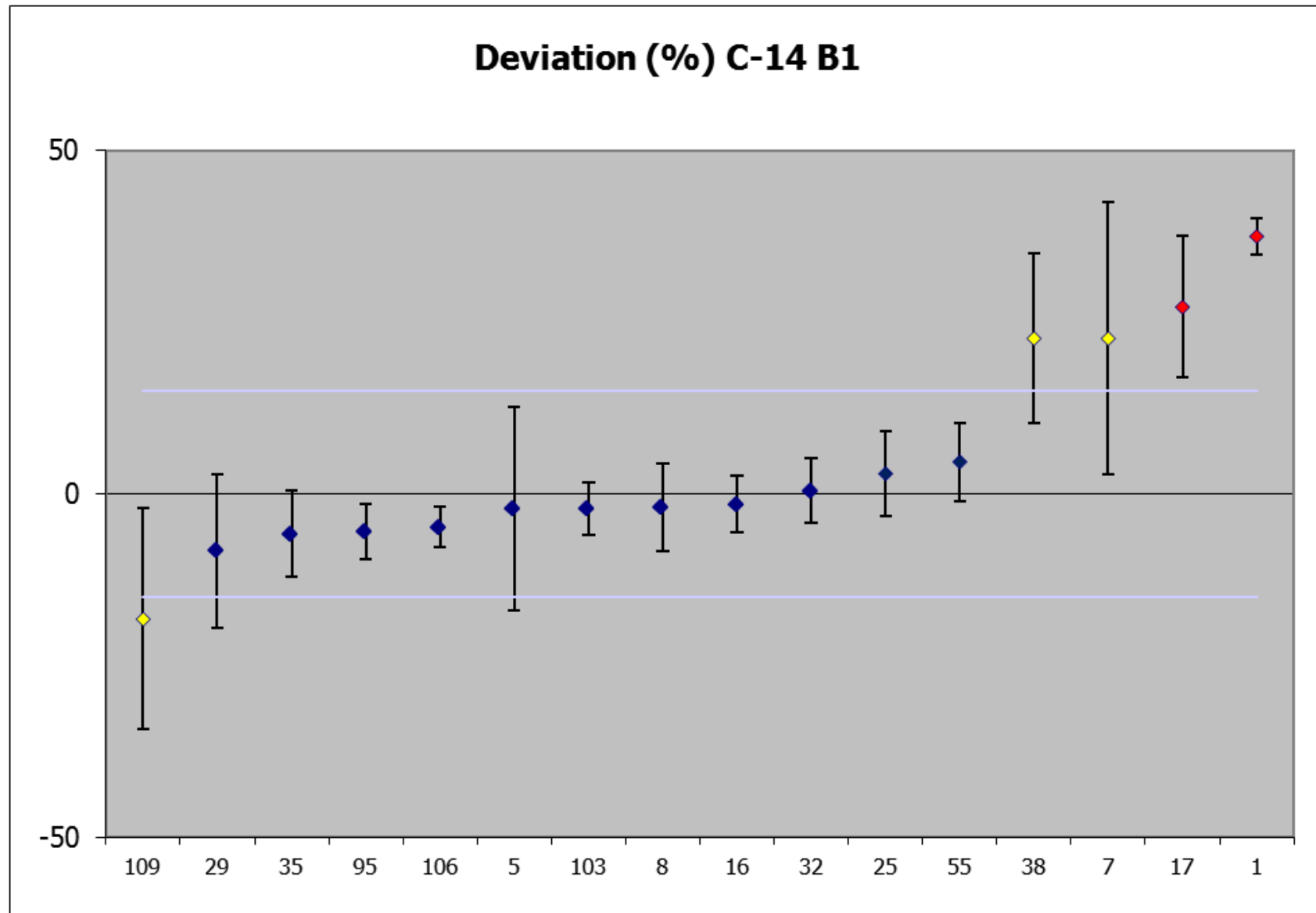


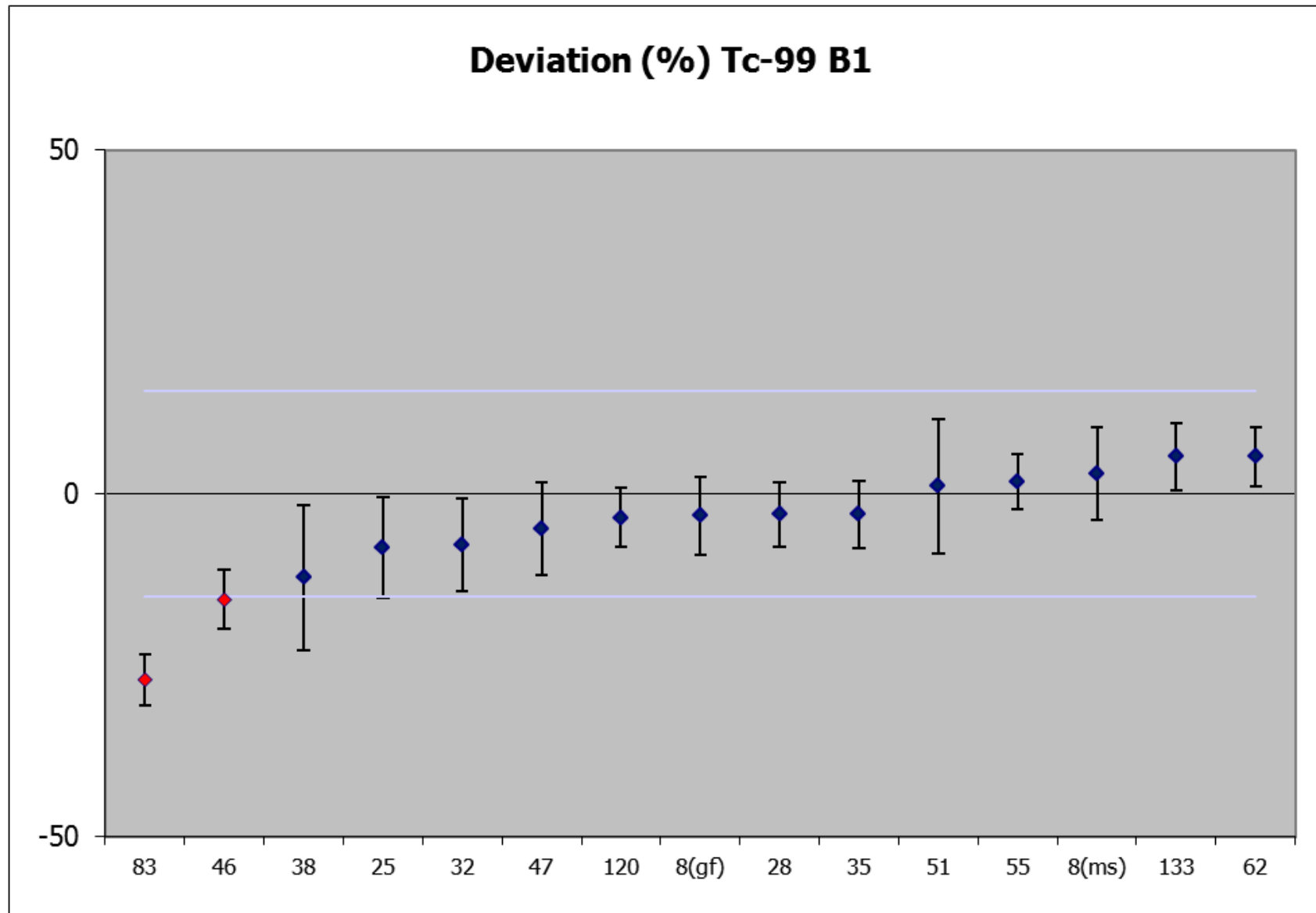
Beta One (B1)

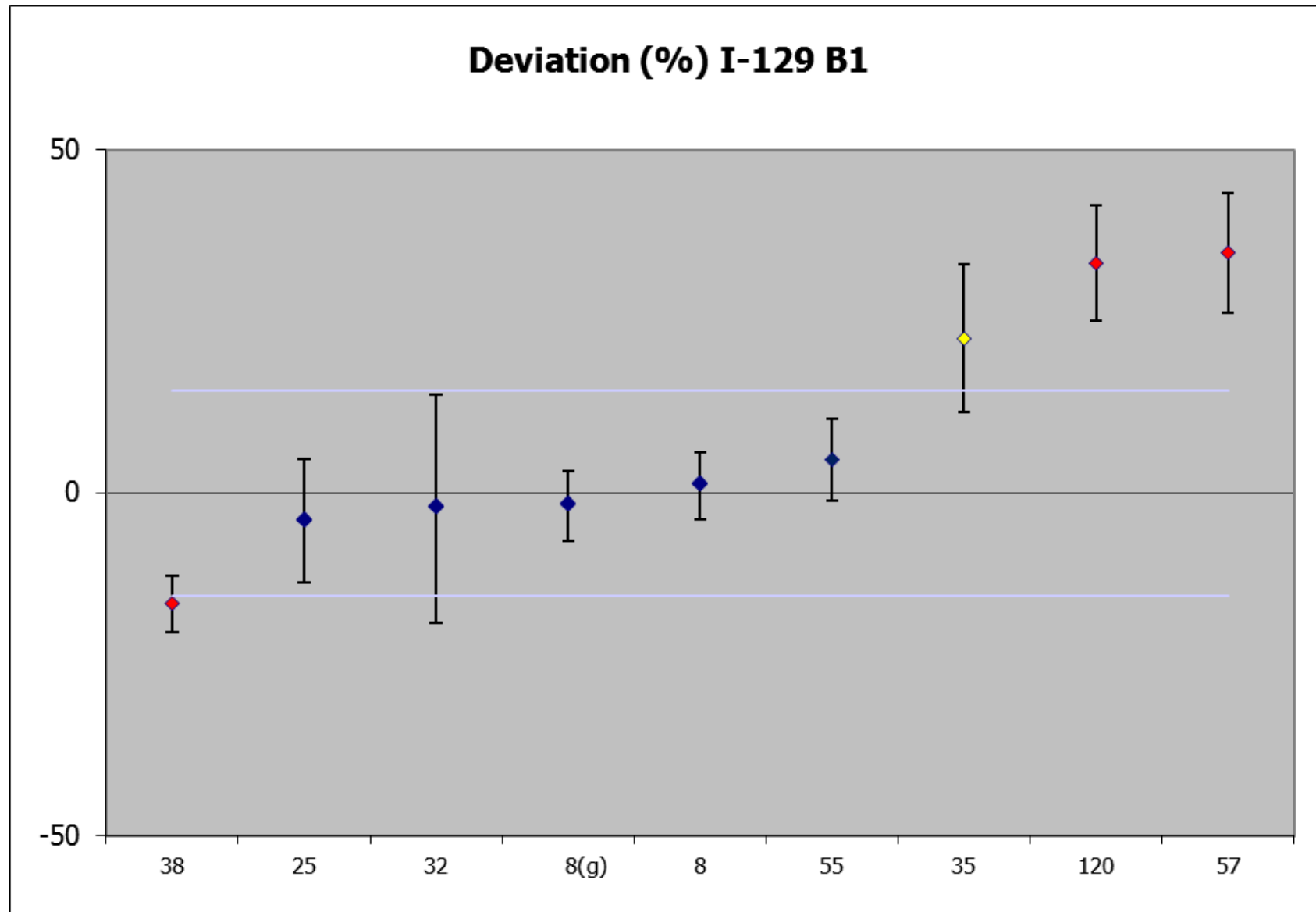
Deviation Plots

d = distillation
c = combustion
g = gamma spectrometry
ms = mass spectrometry



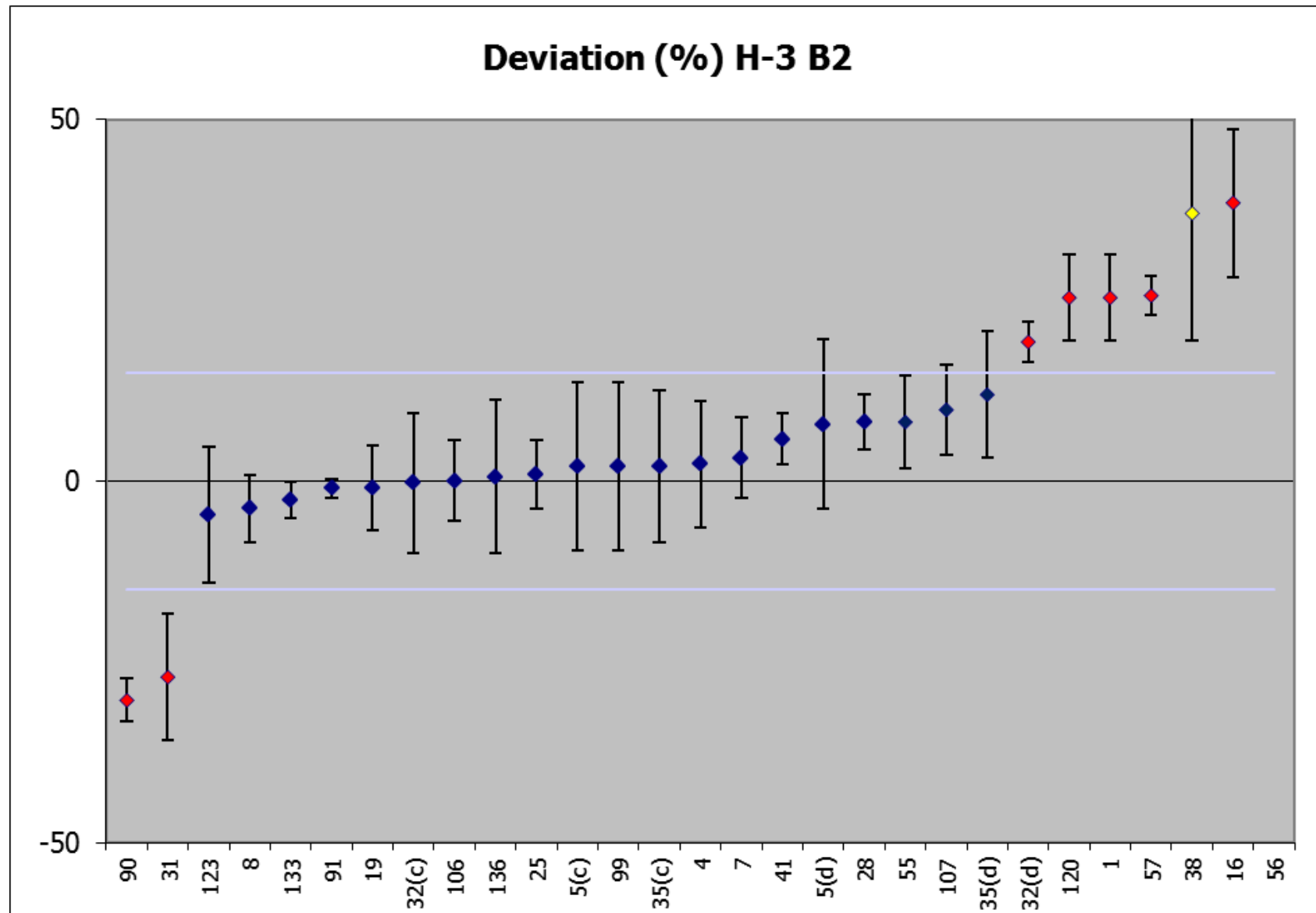


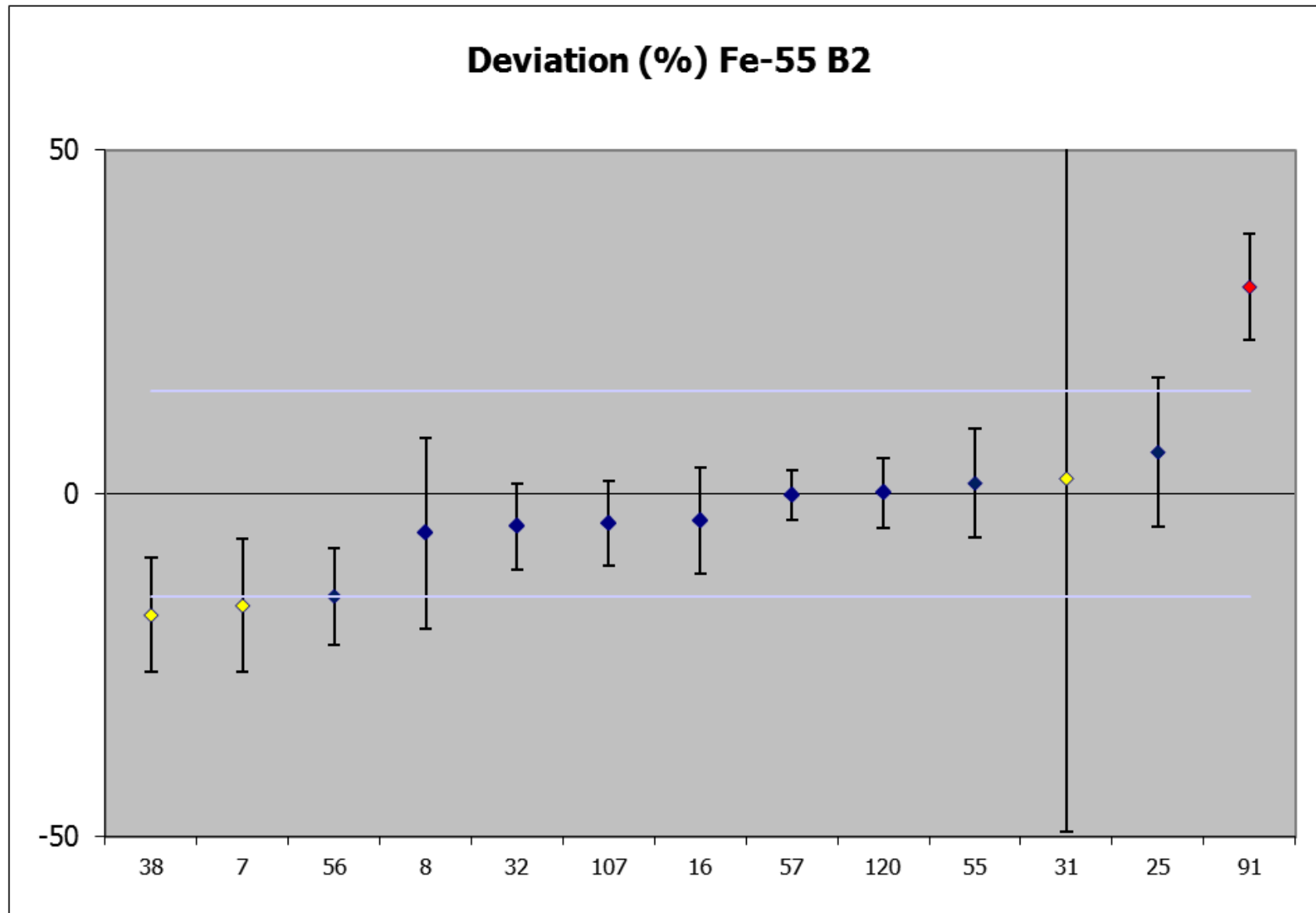


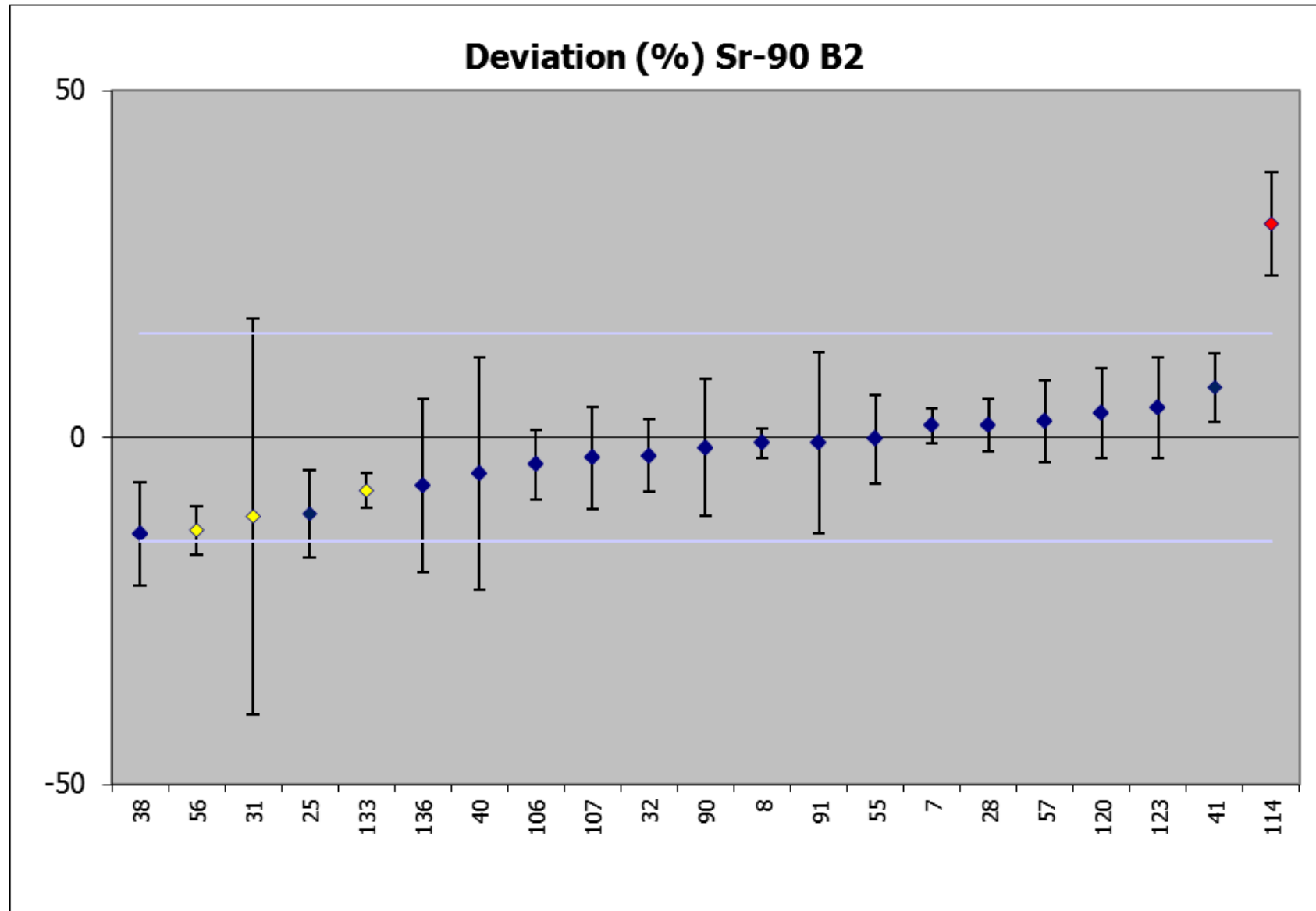


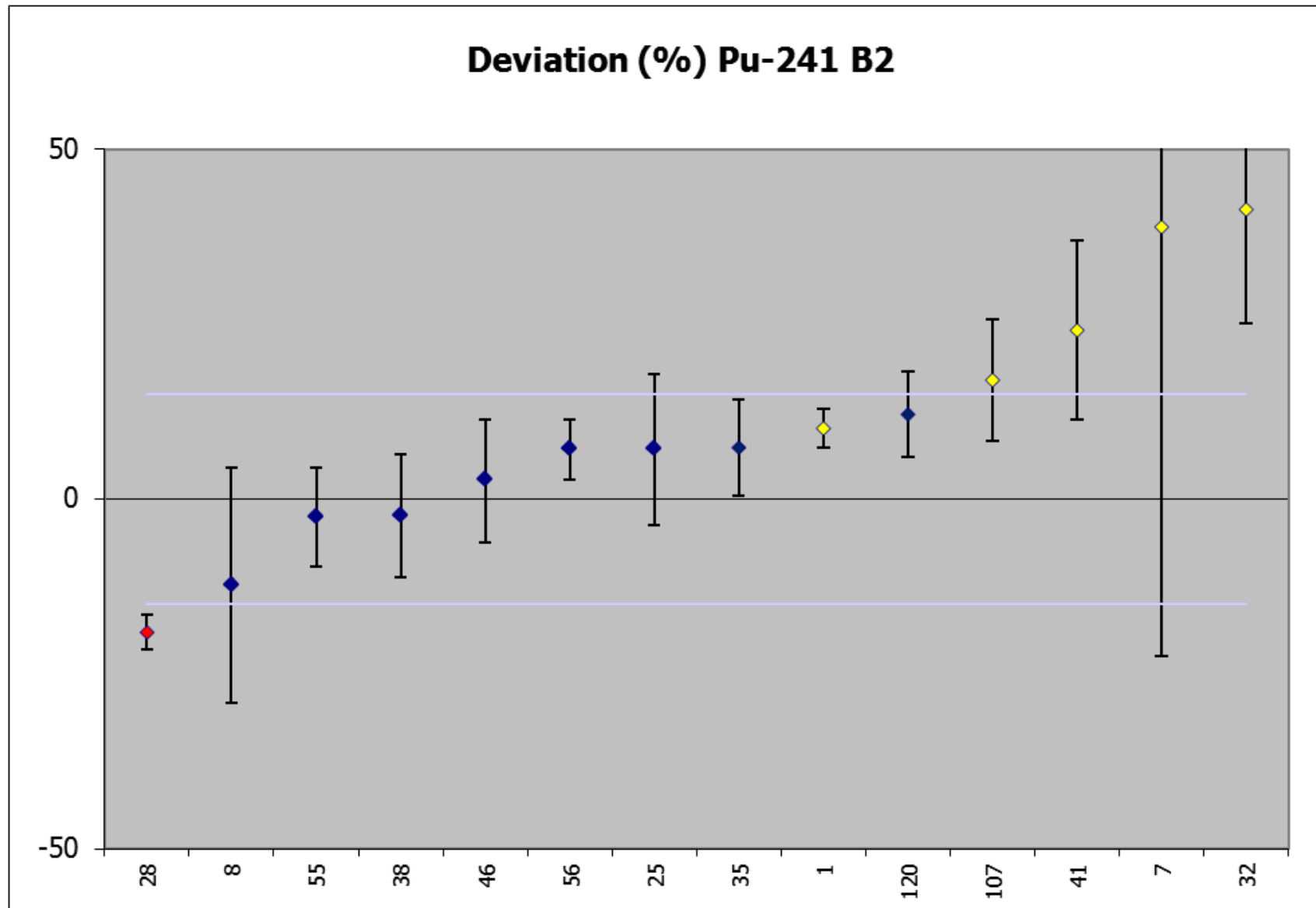
Beta Two (B2) Deviation Plots

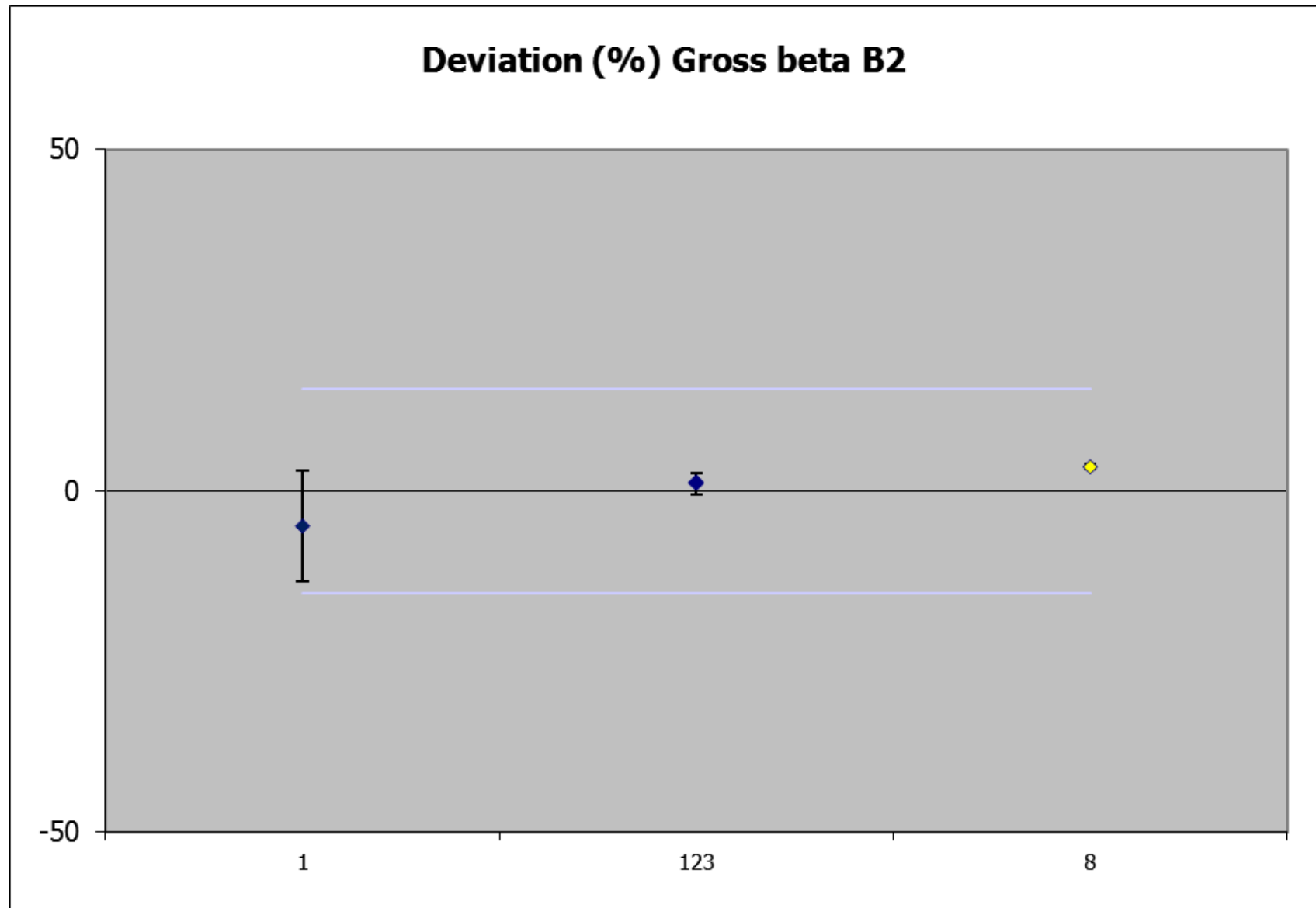
d = distillation
c = combustion
gf = gas flow proportional counter



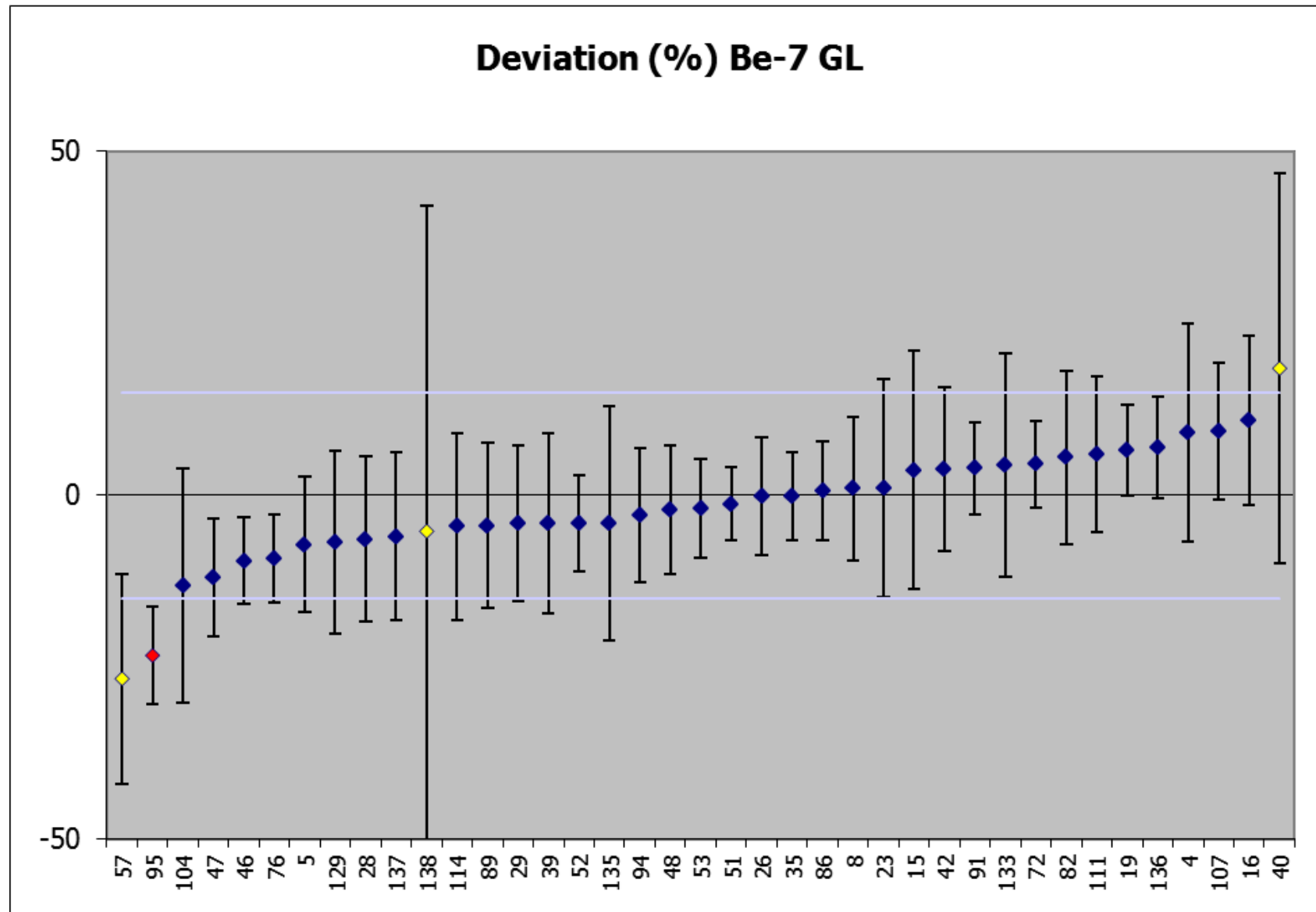


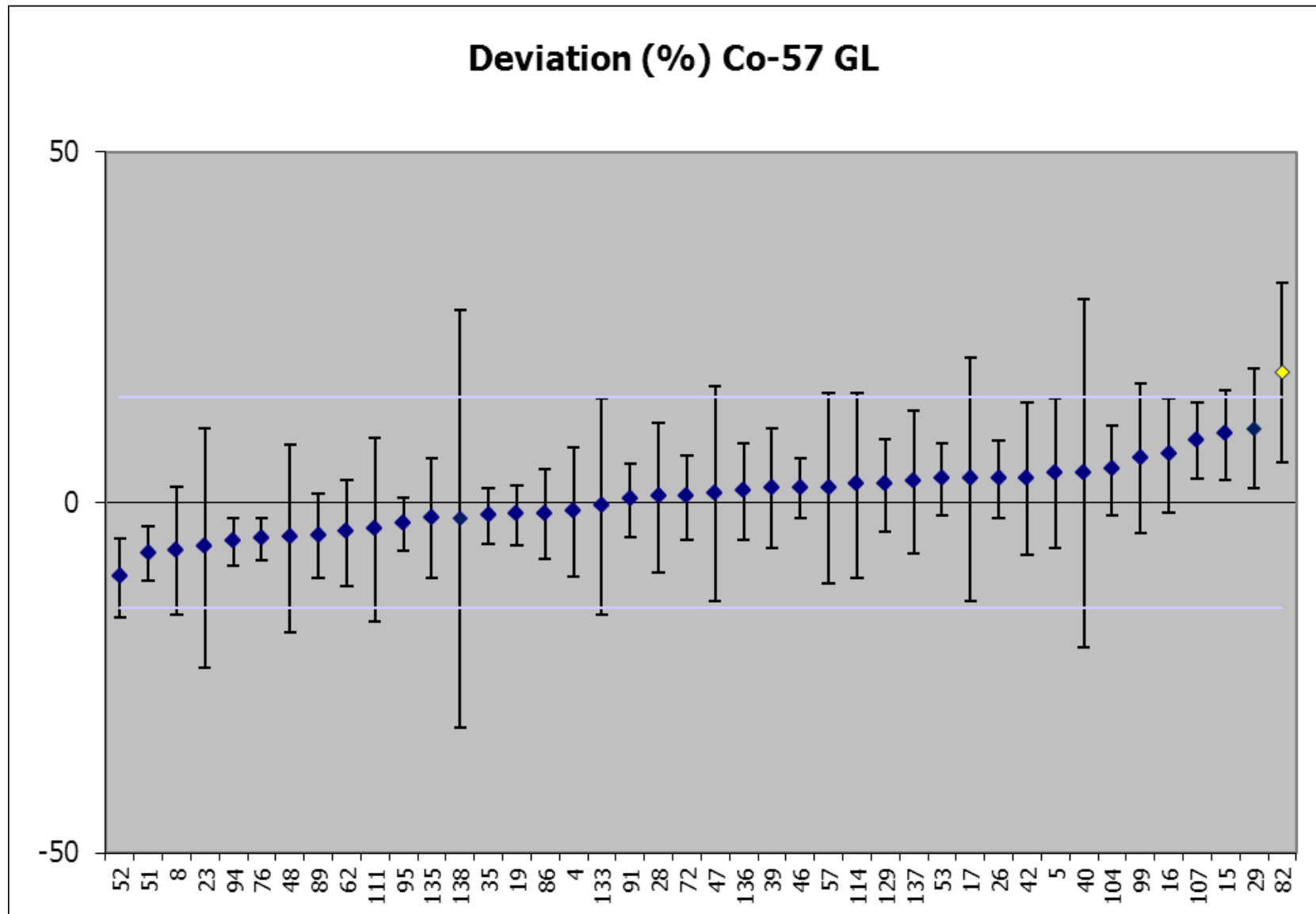


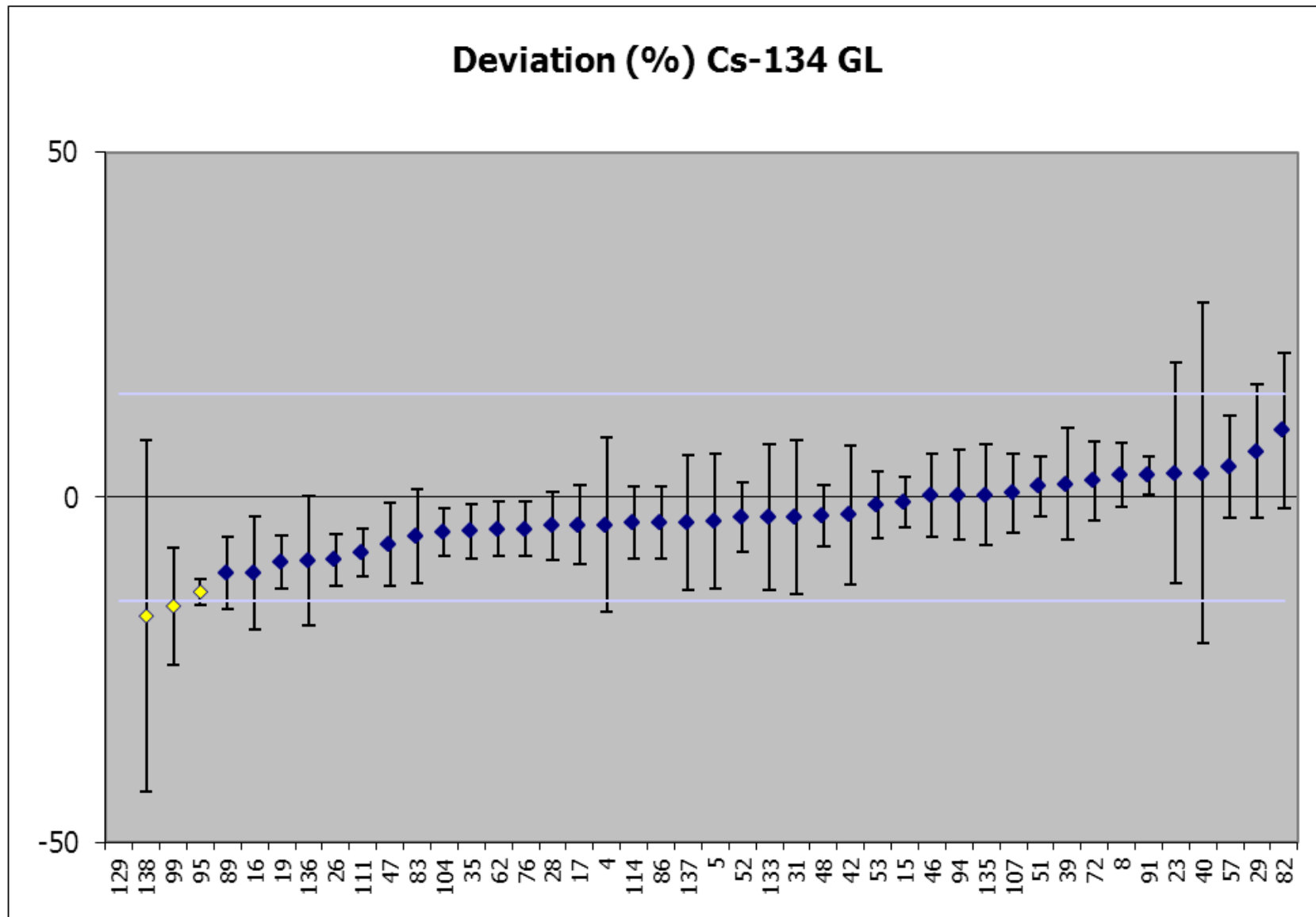


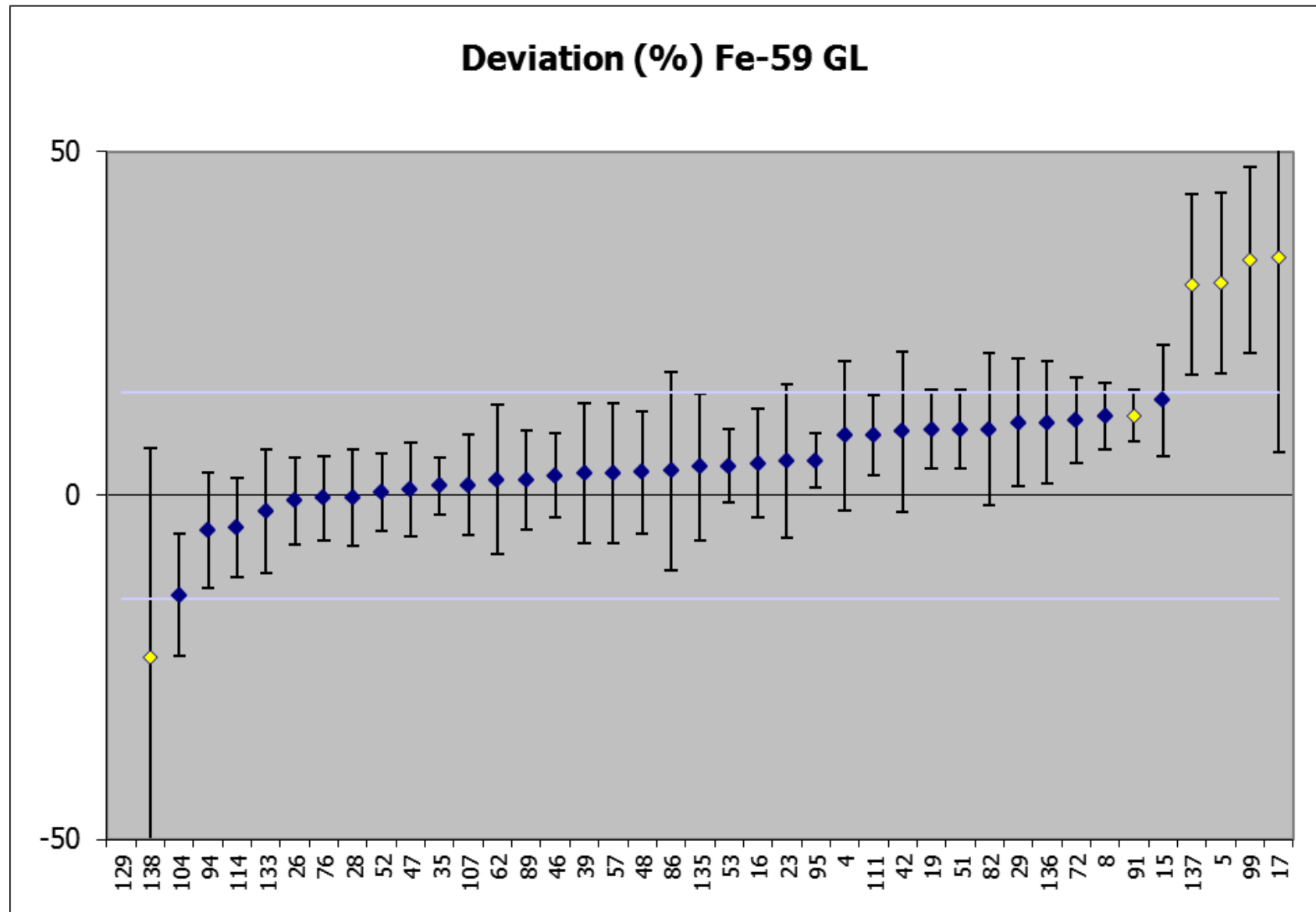


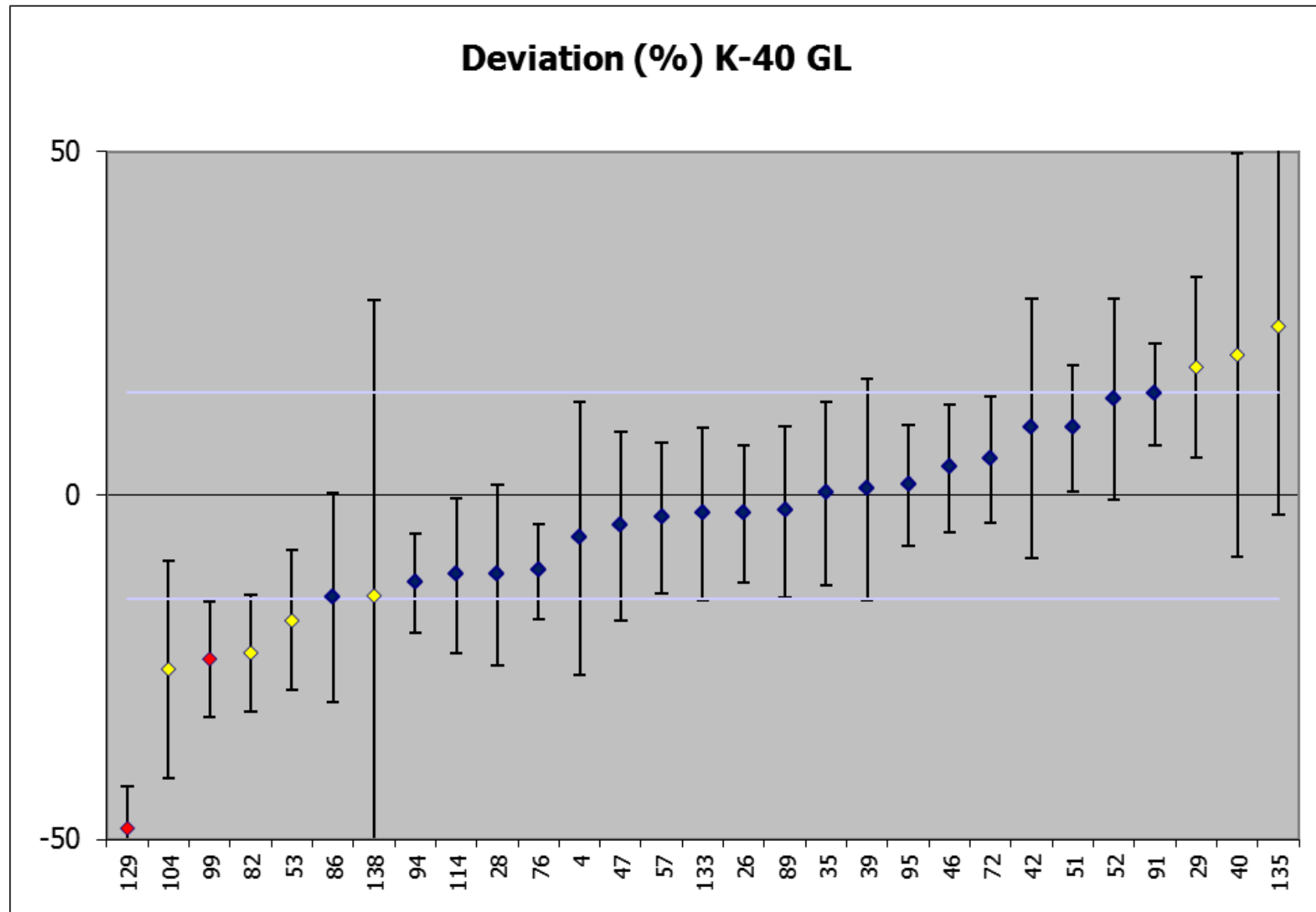
Gamma Low (GL) Deviation Plots

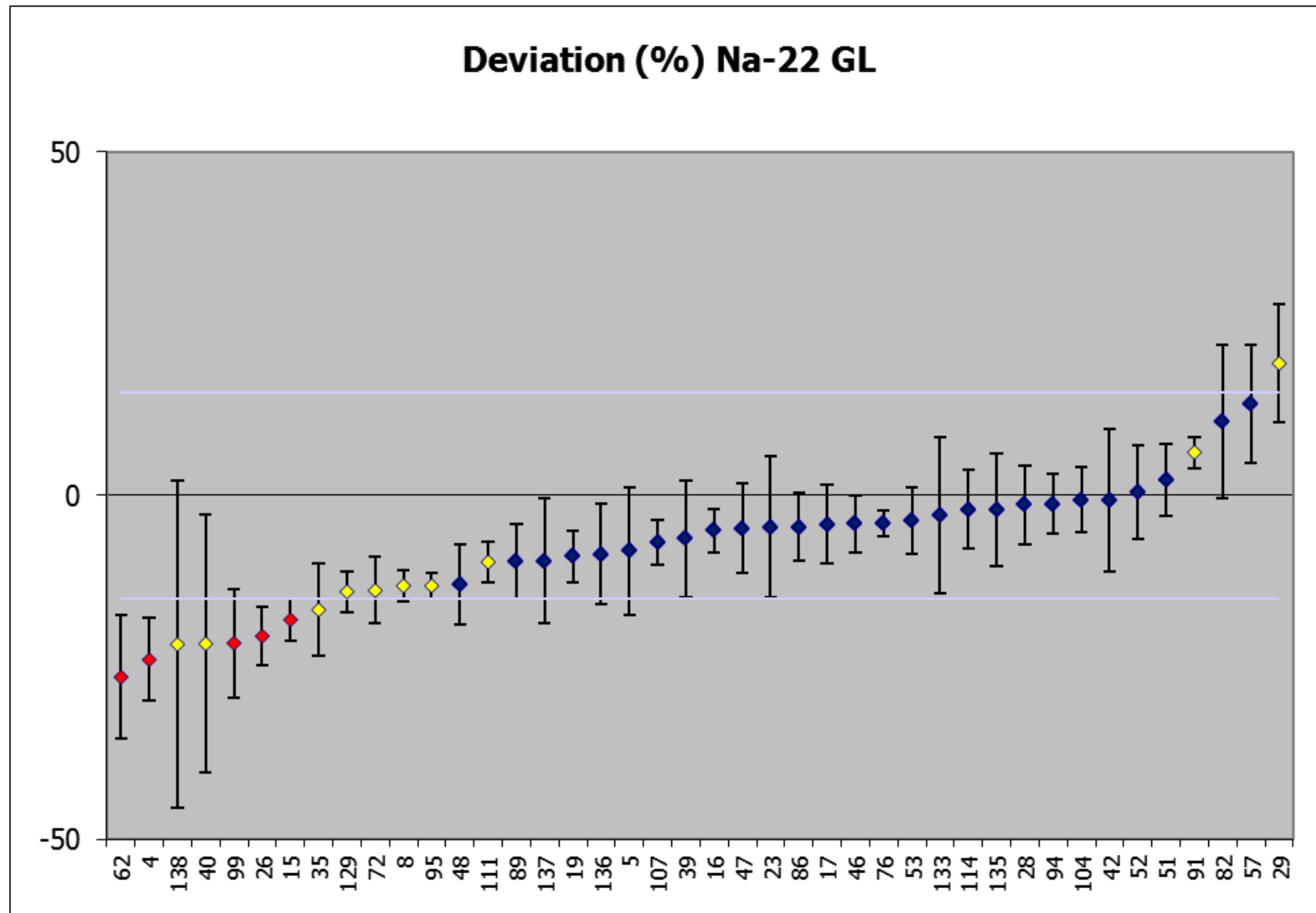


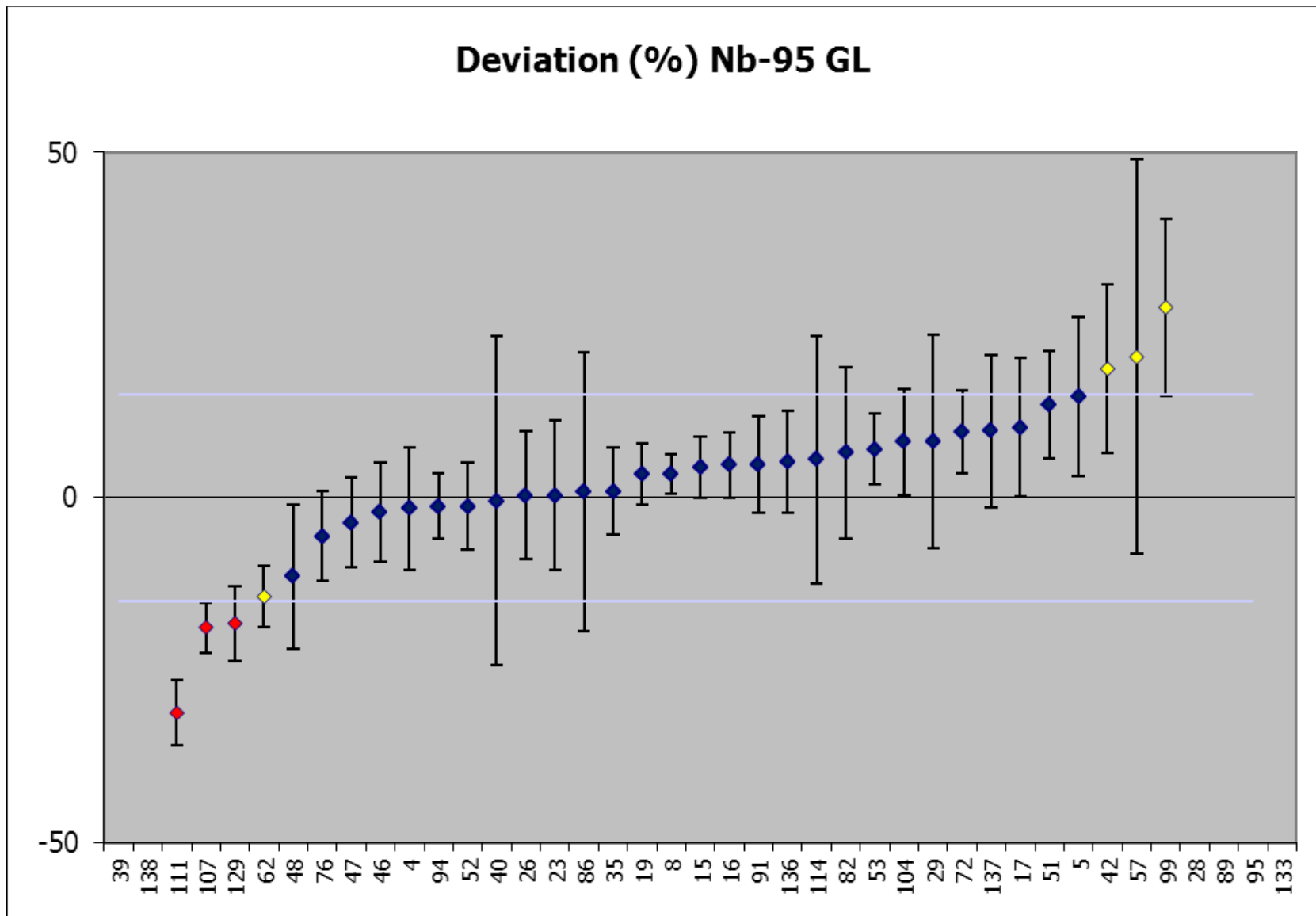


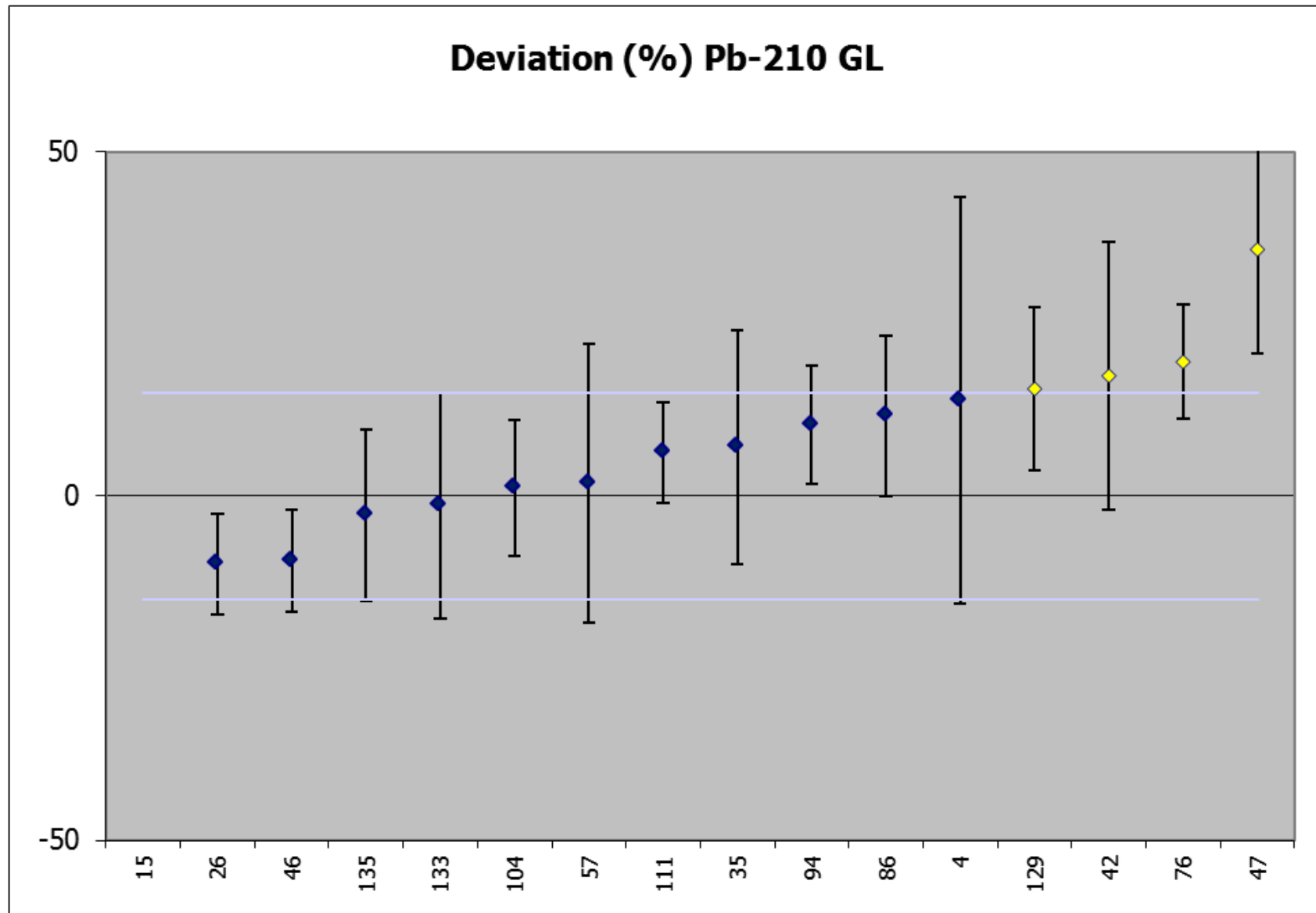


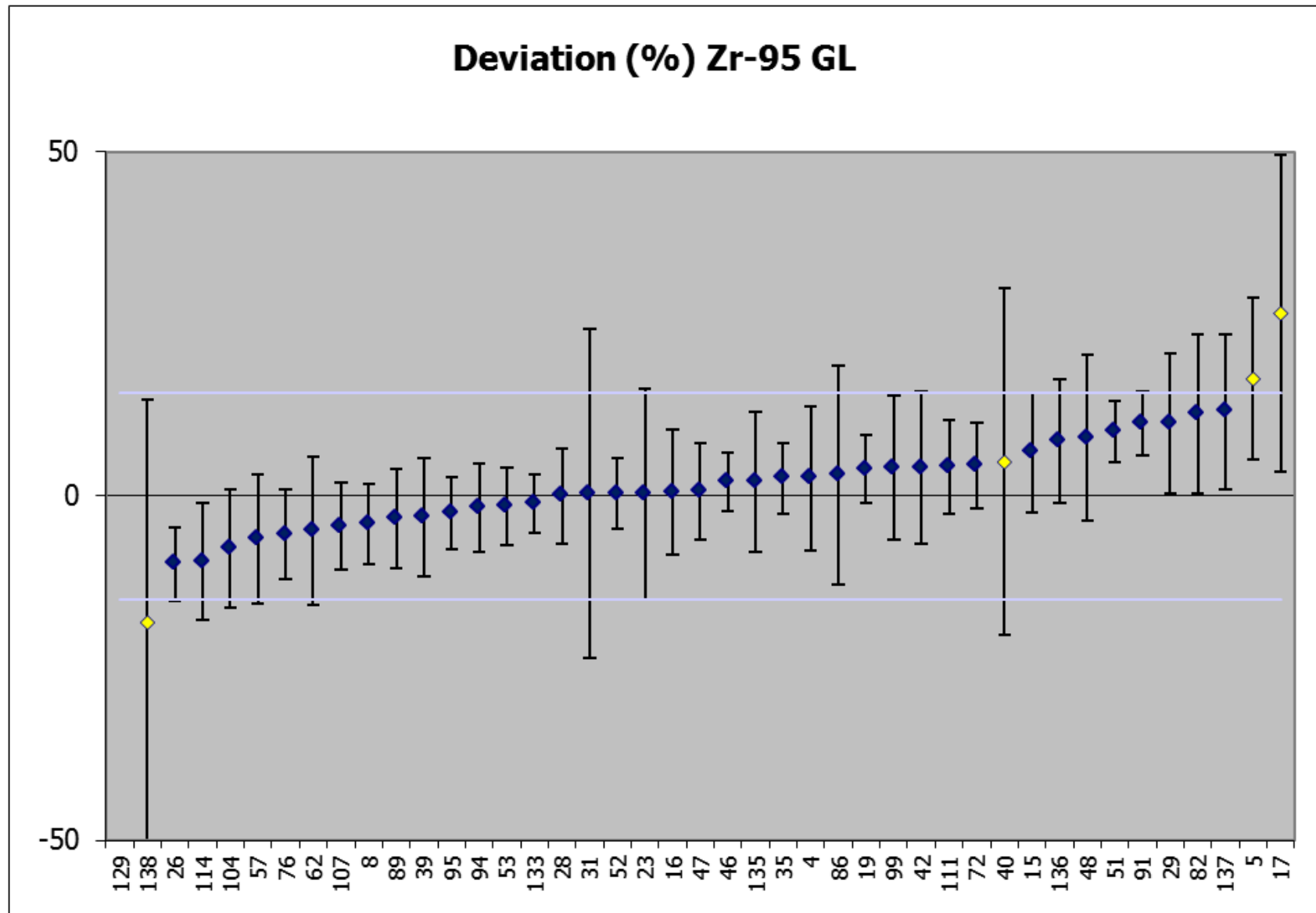




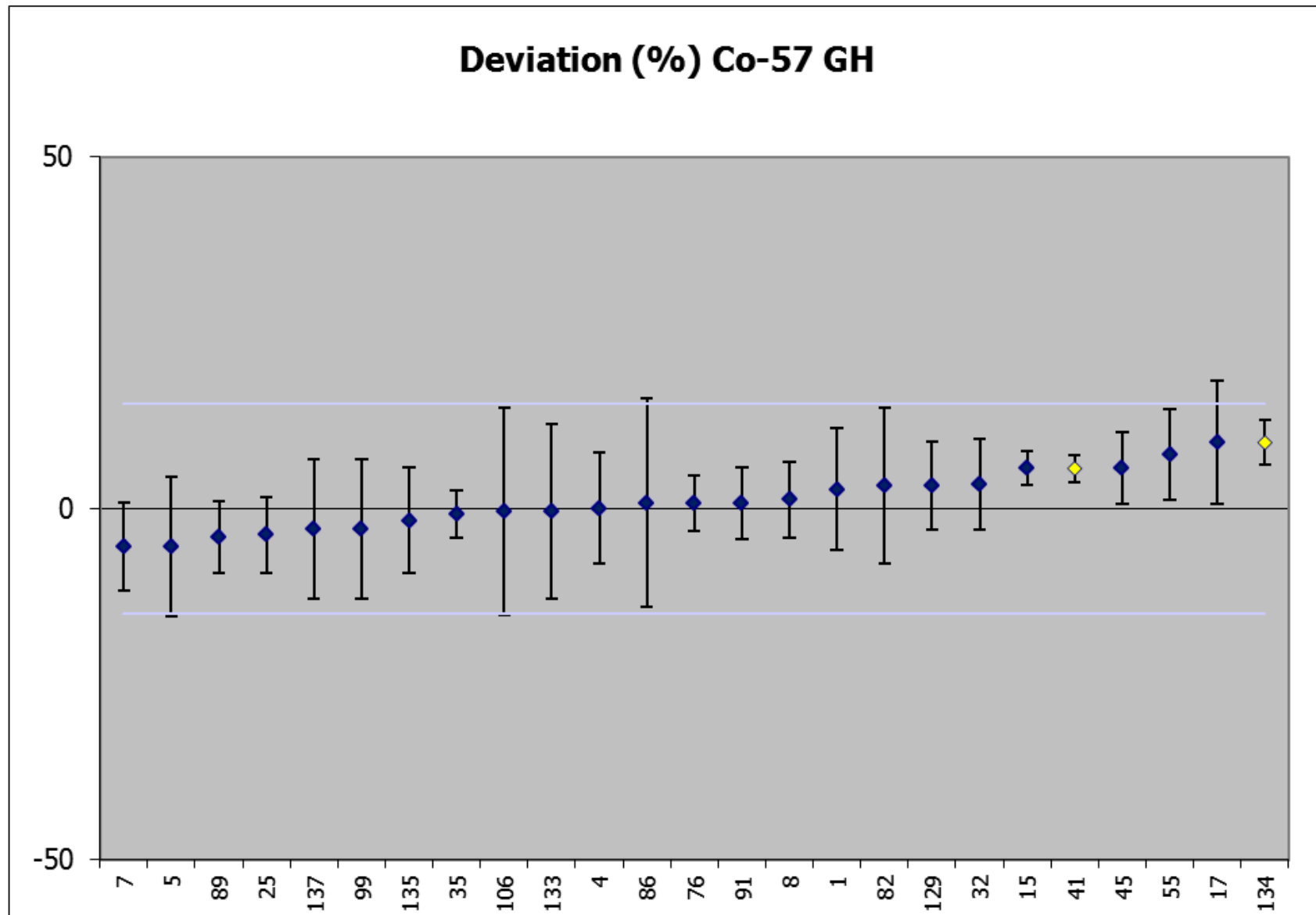


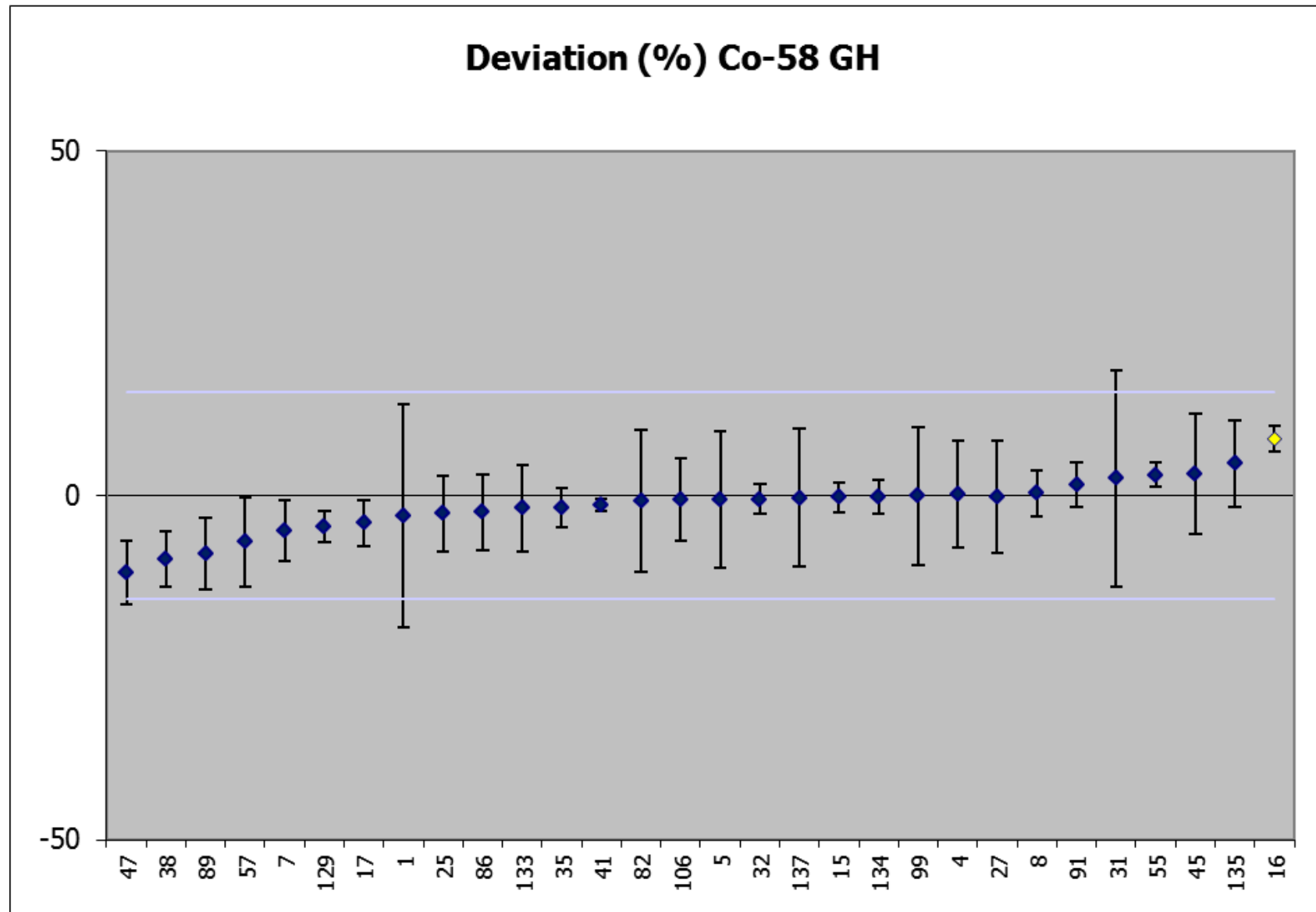


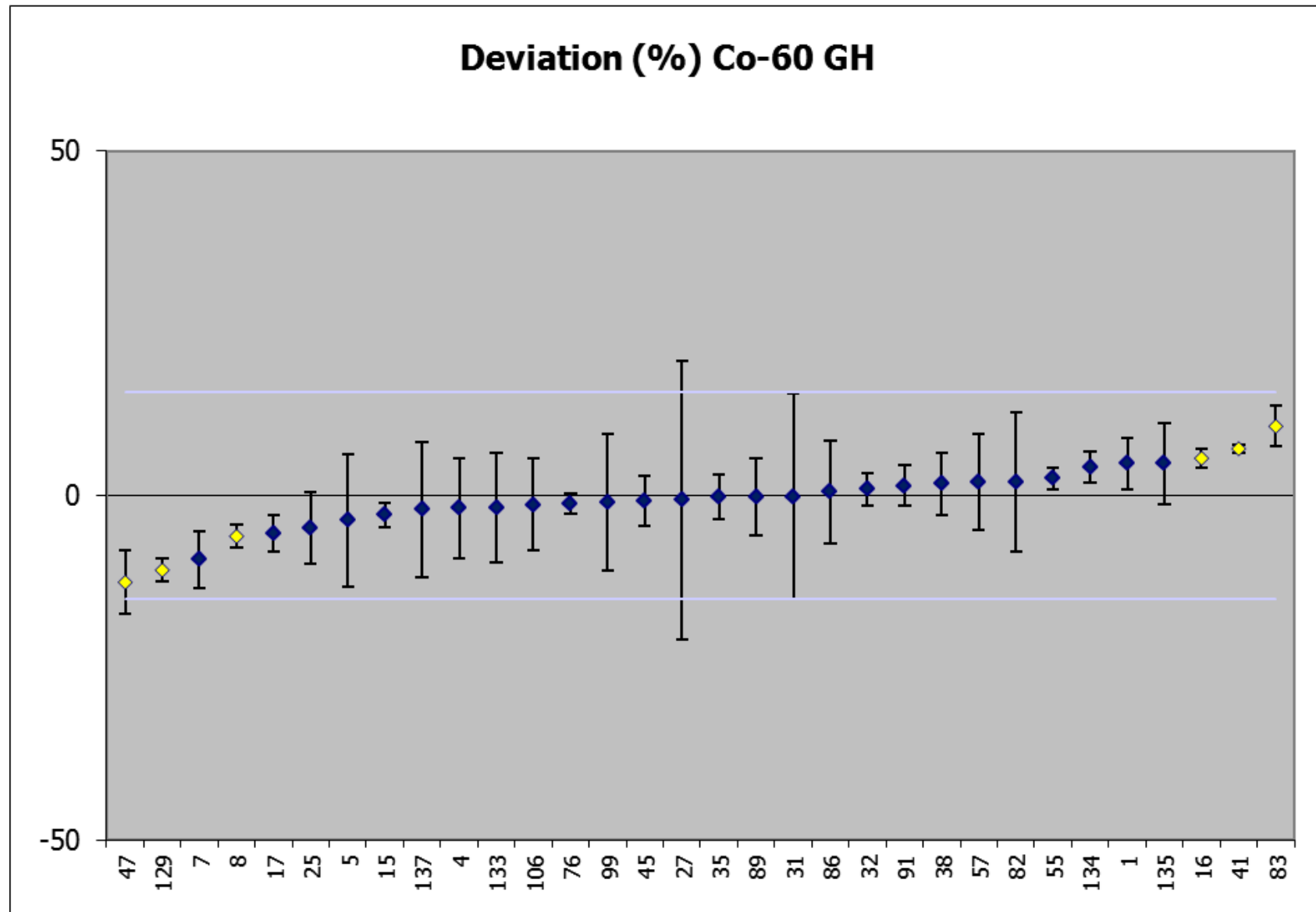


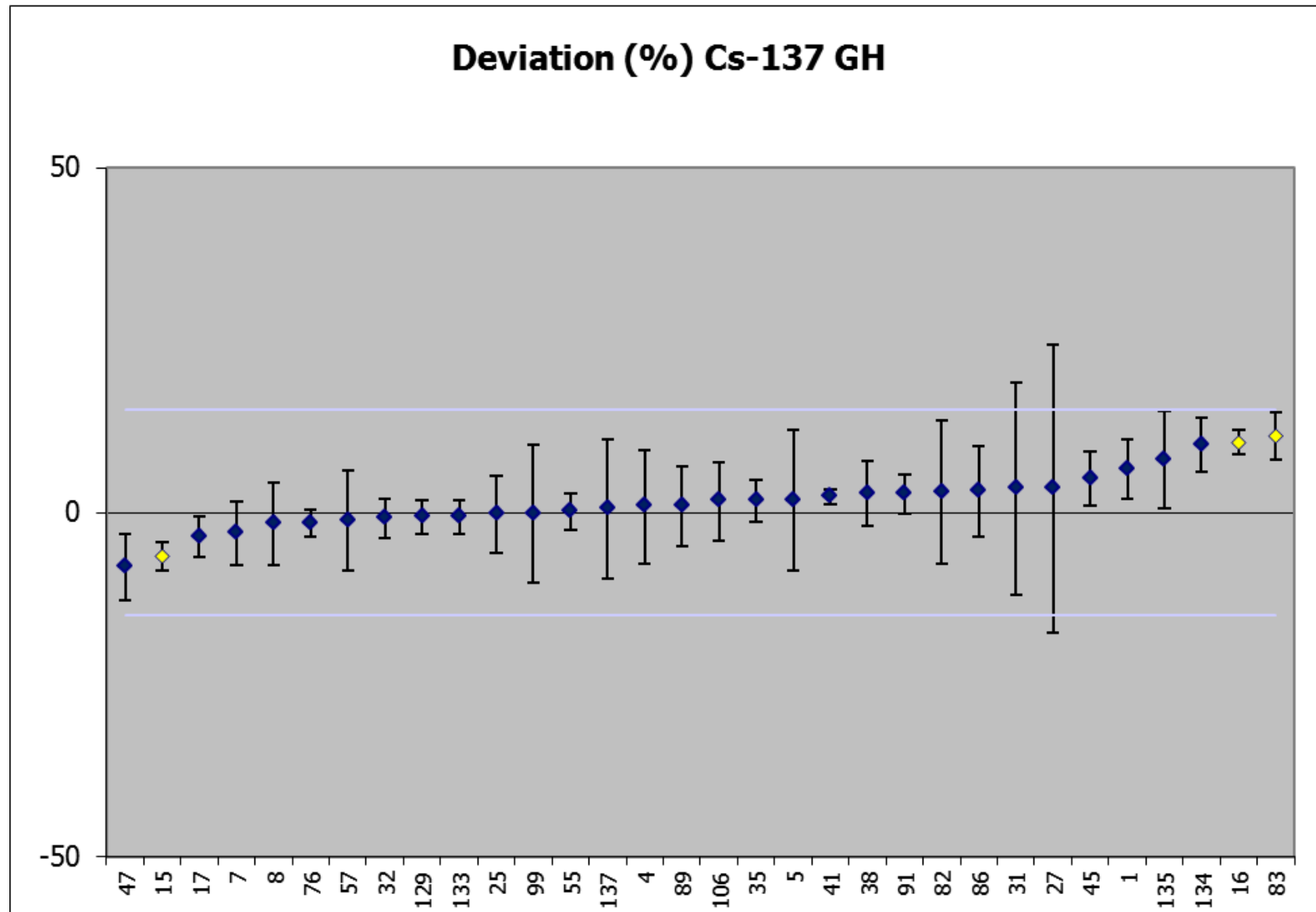


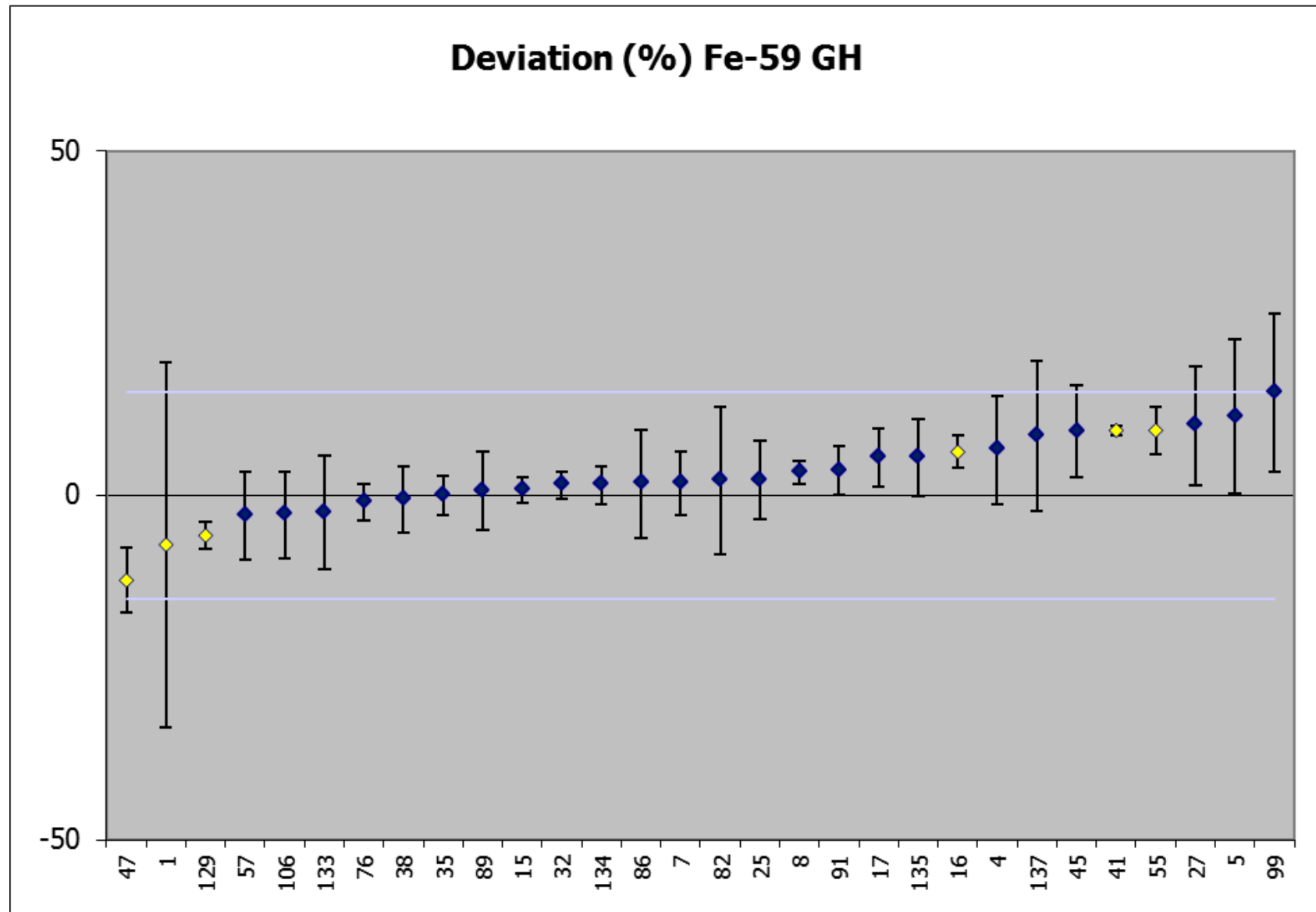
Gamma High (GH) Deviation Plots

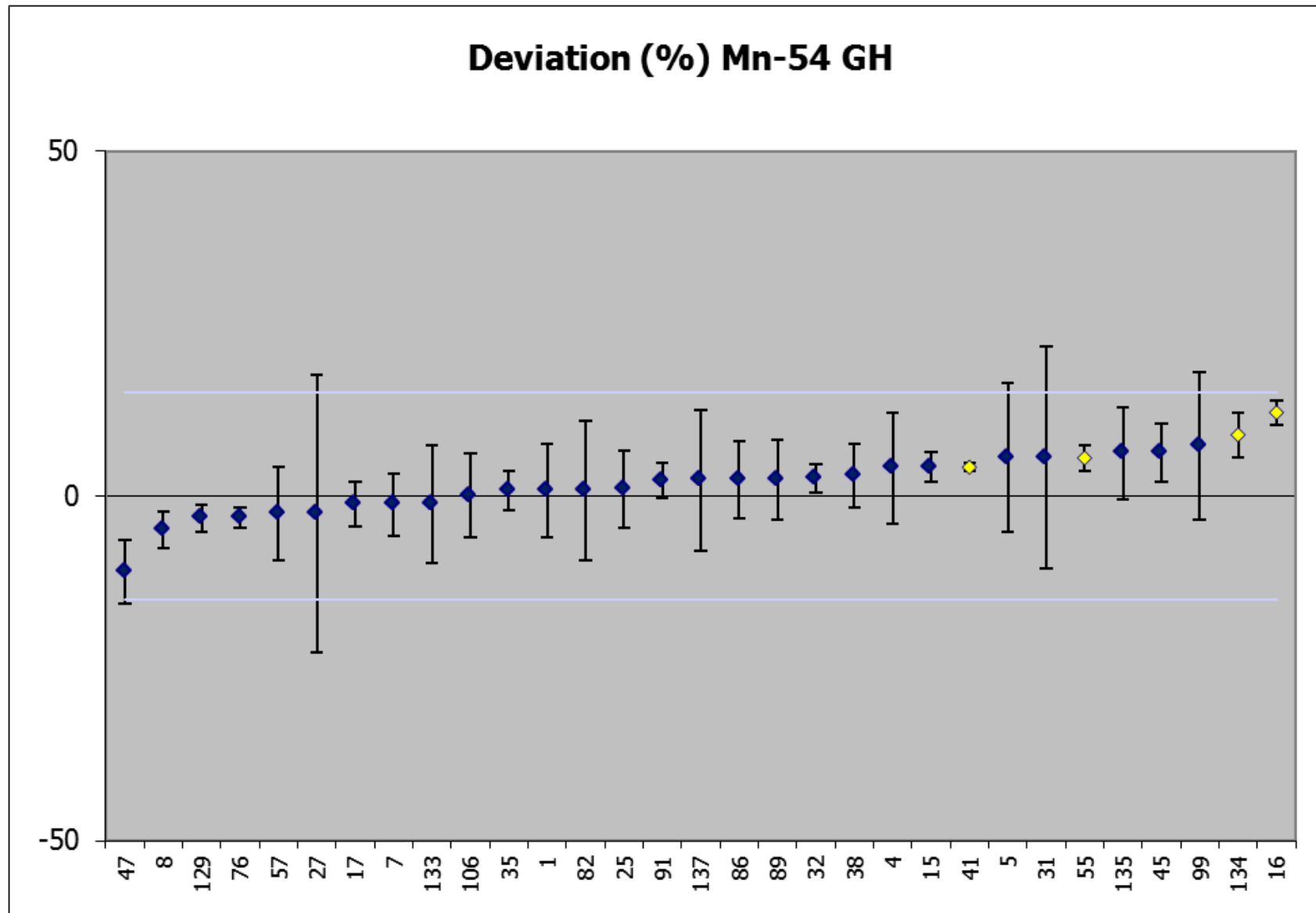


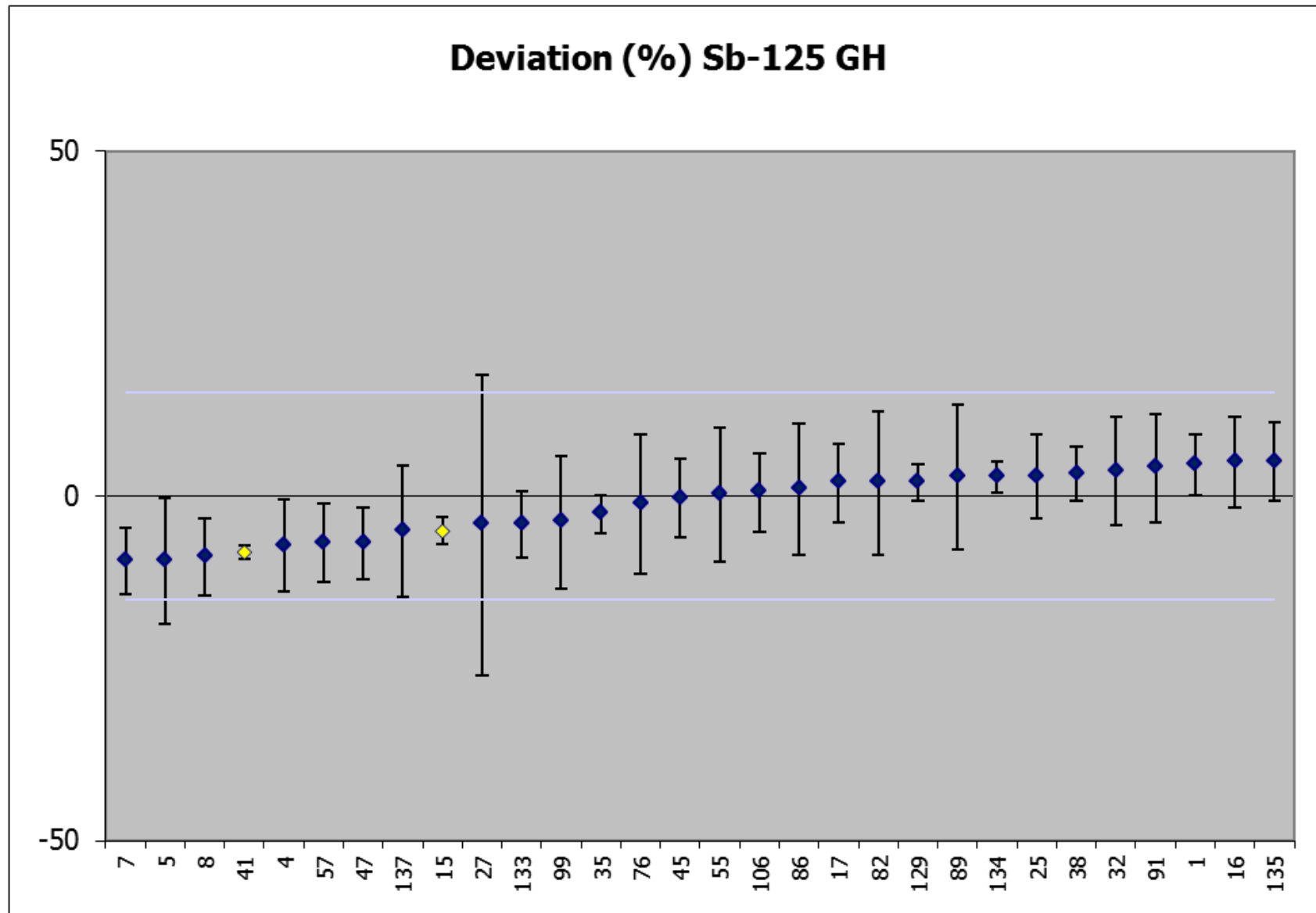








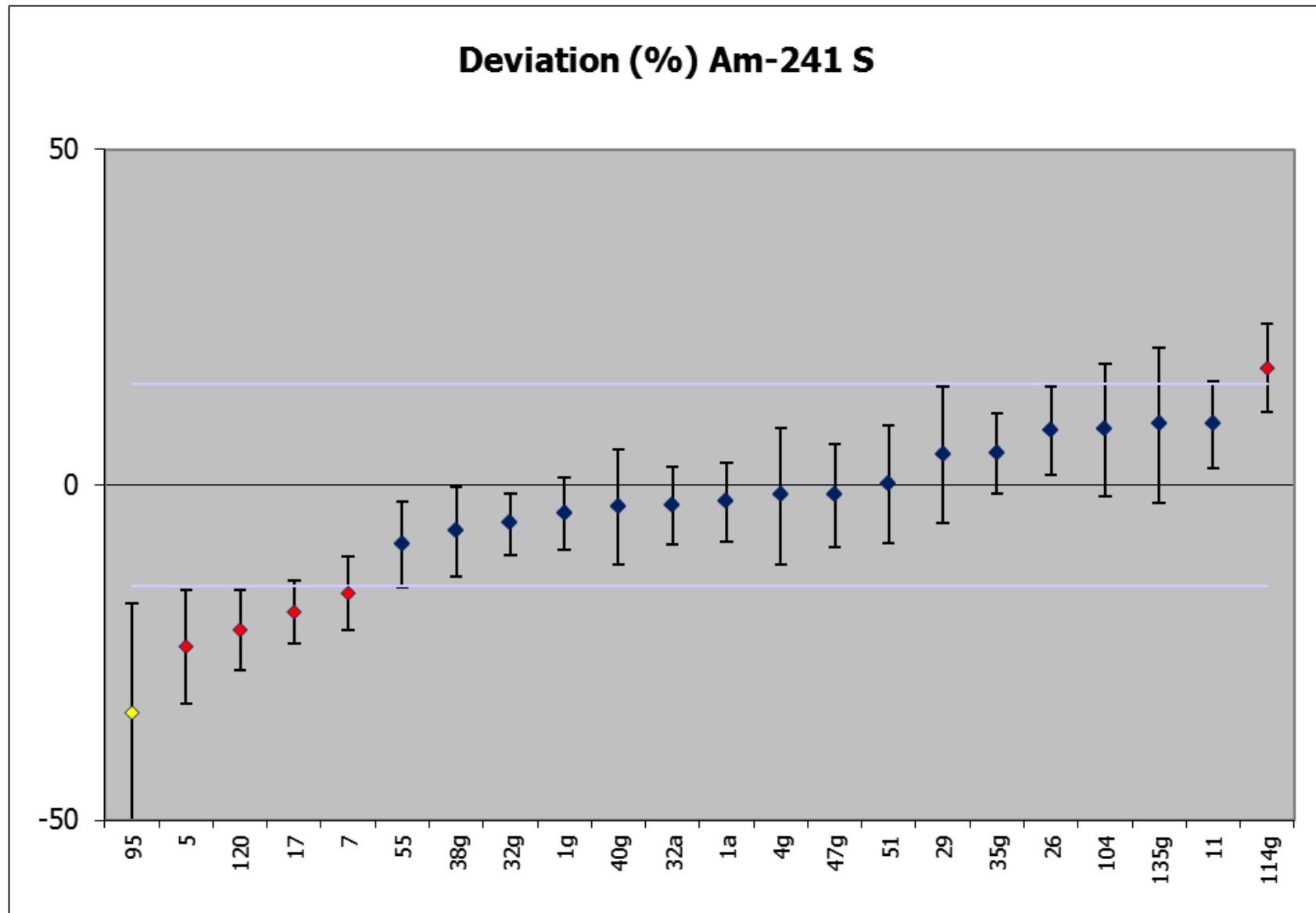


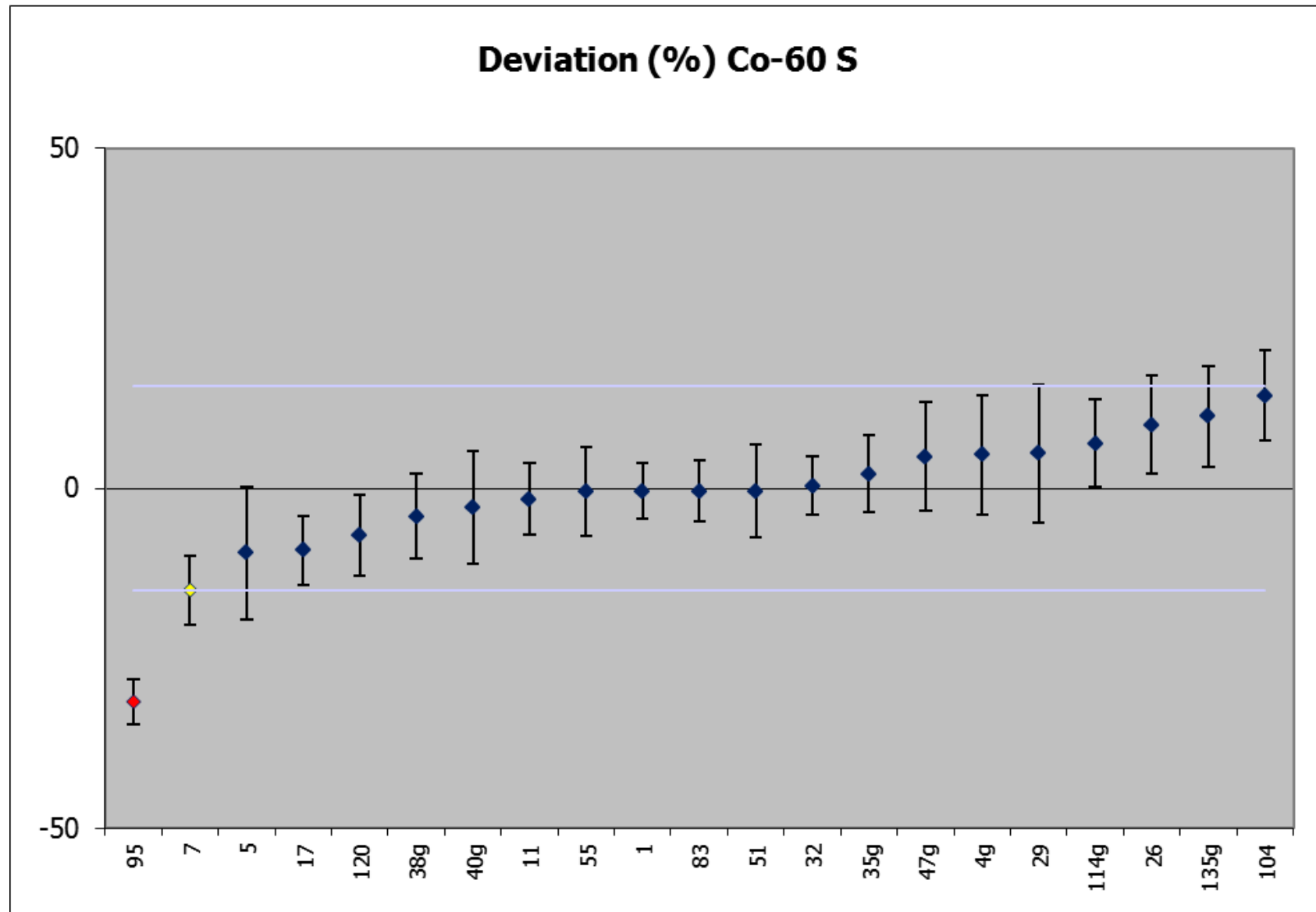


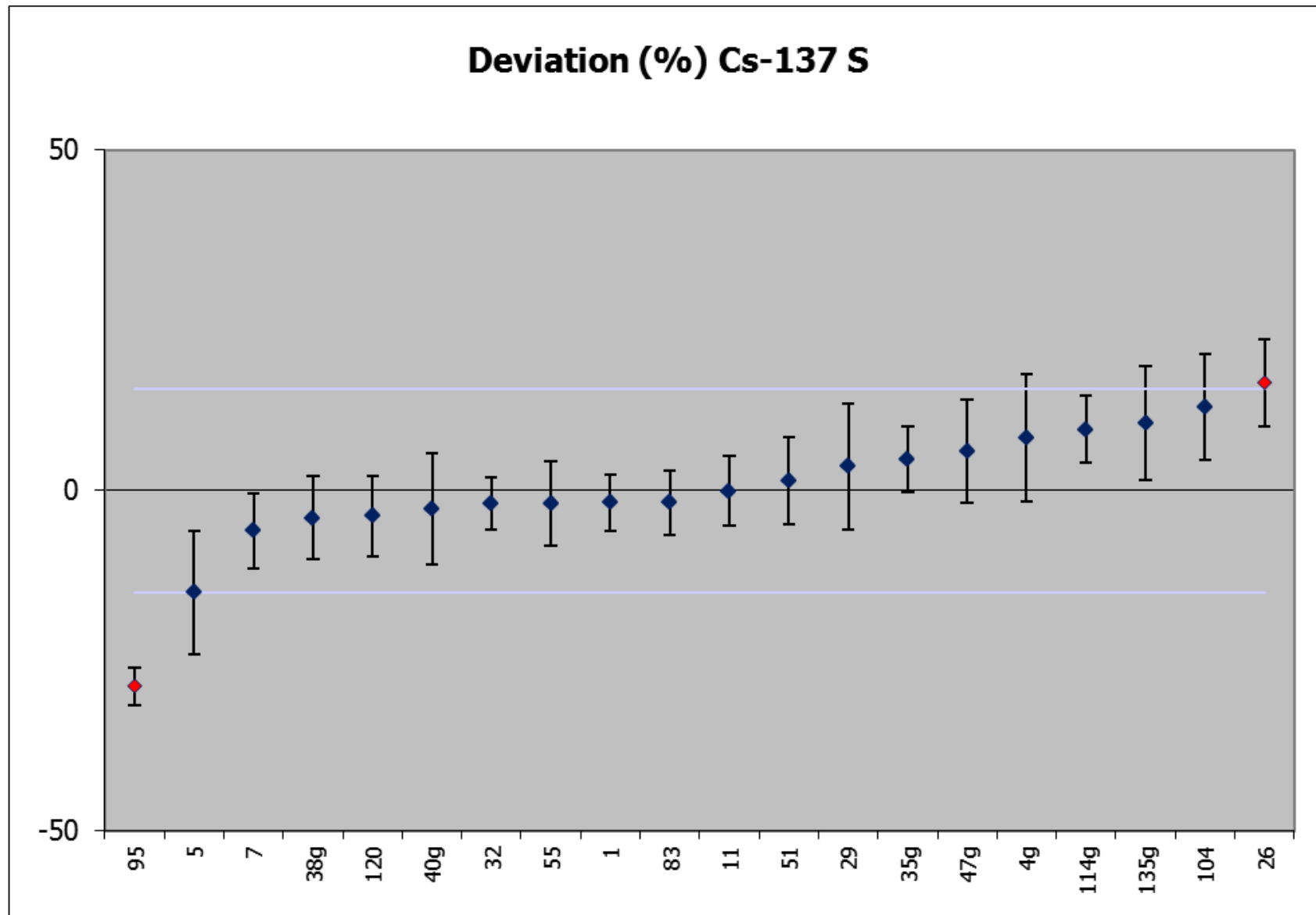
Solid (S)

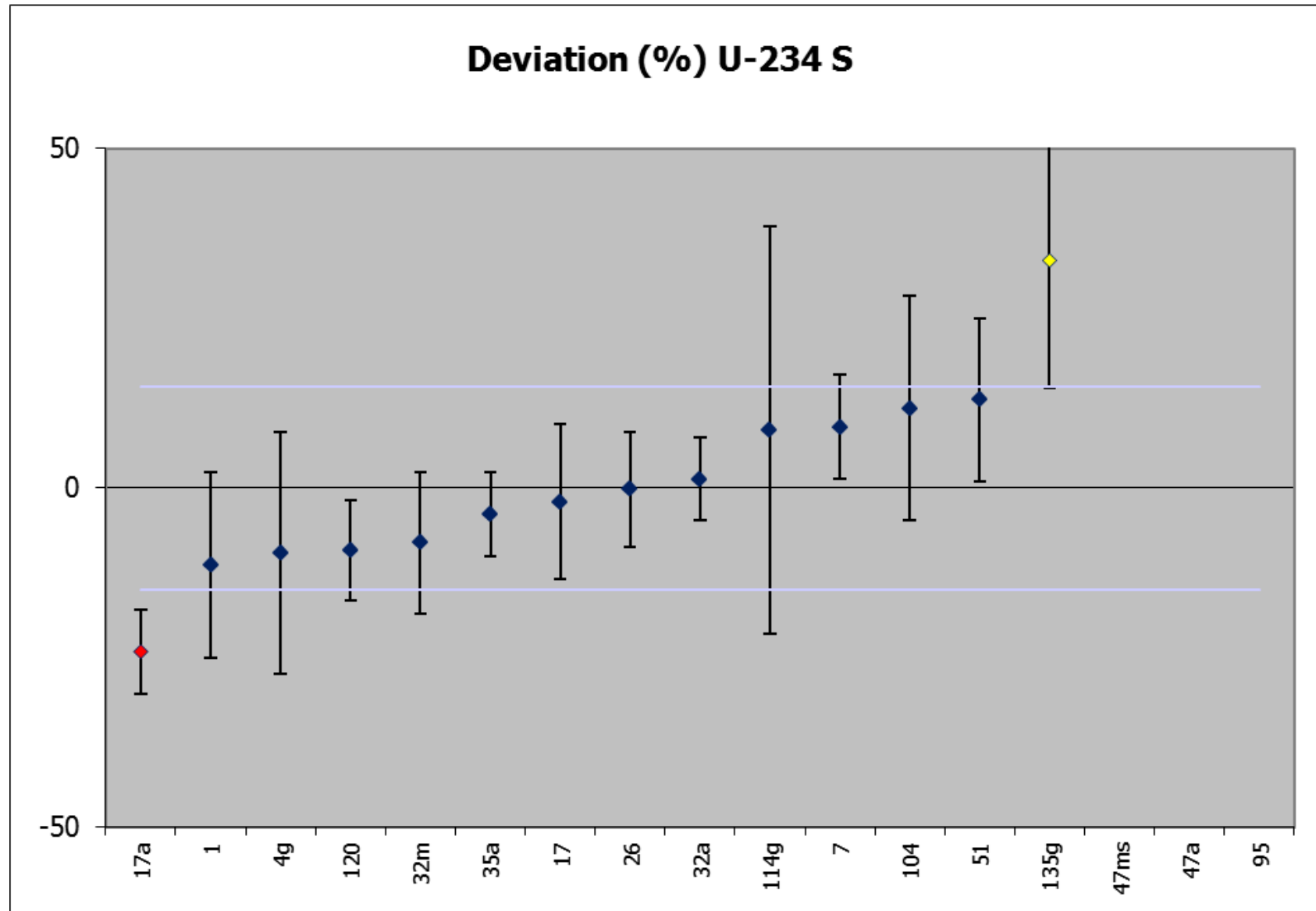
Deviation Plots

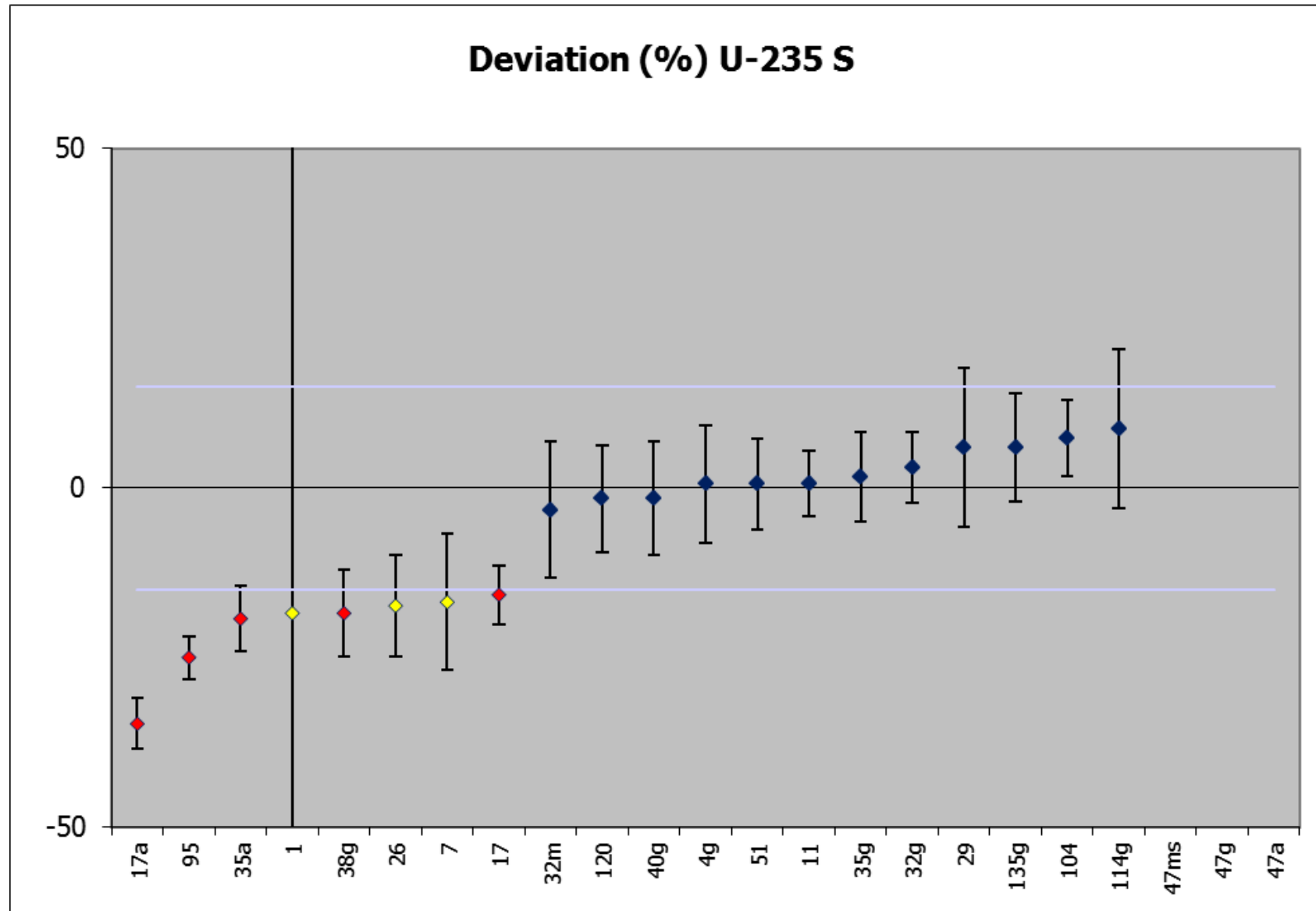
a = alpha spectrometry
g = gamma spectrometry
ms = mass spectrometry

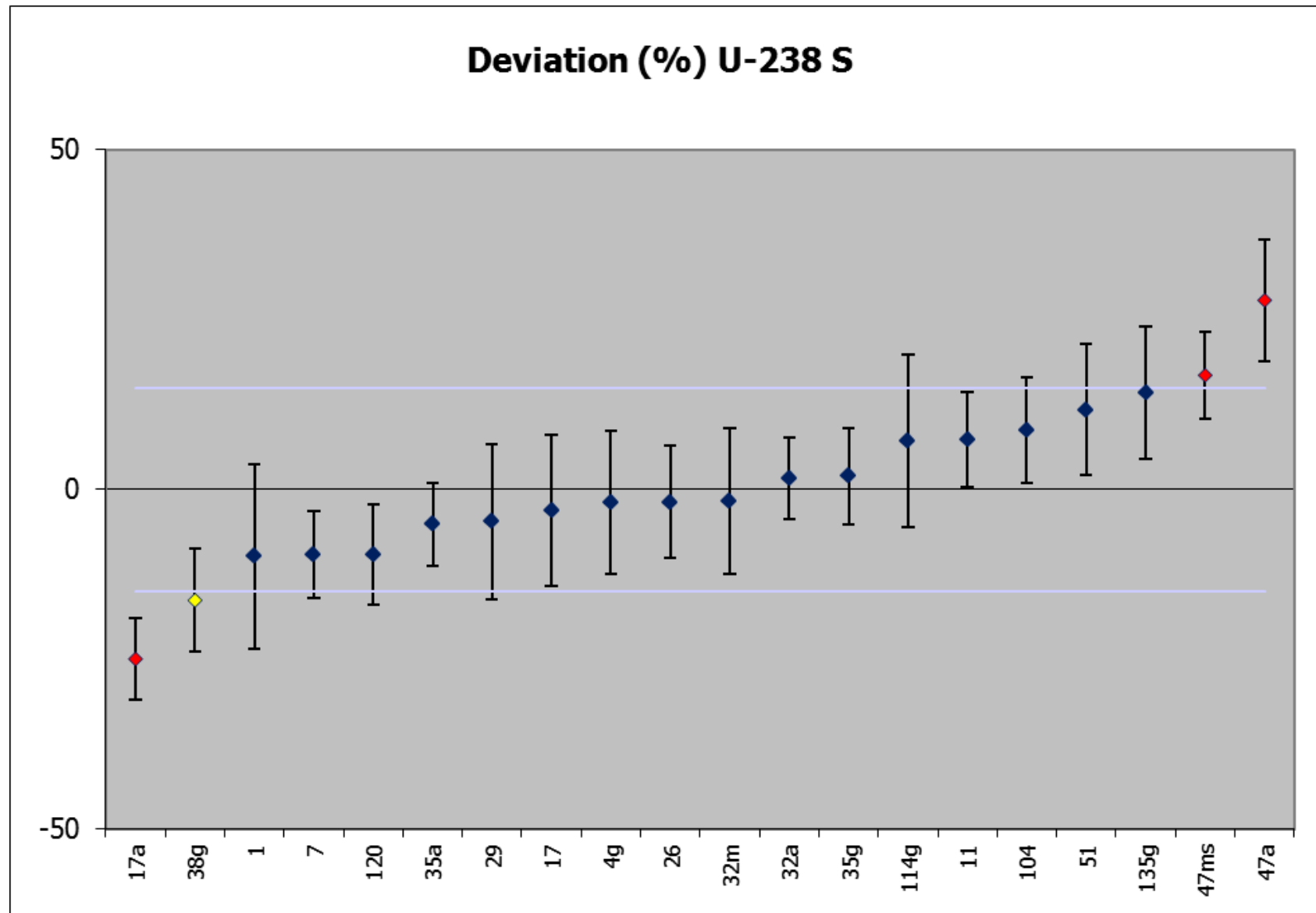






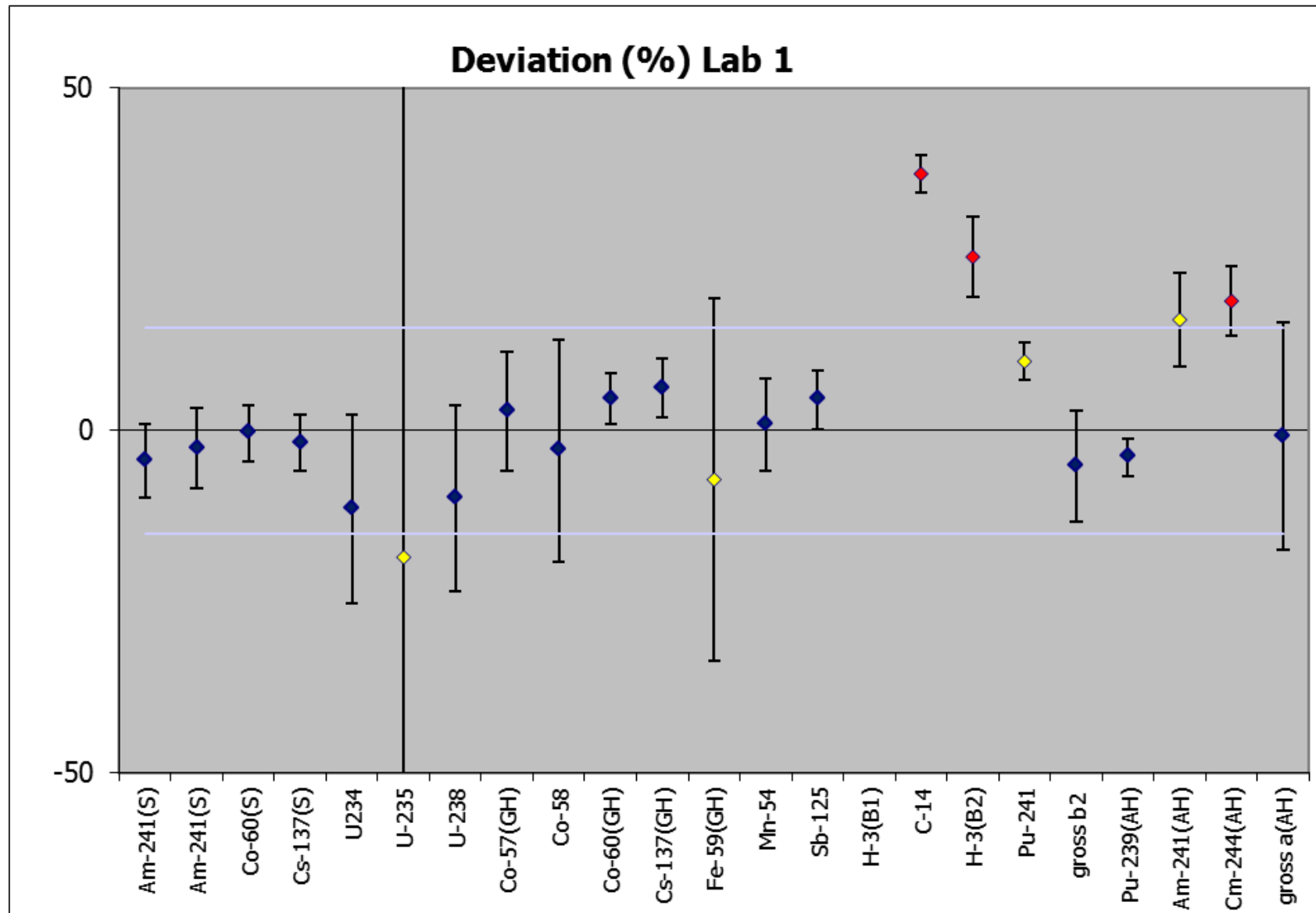






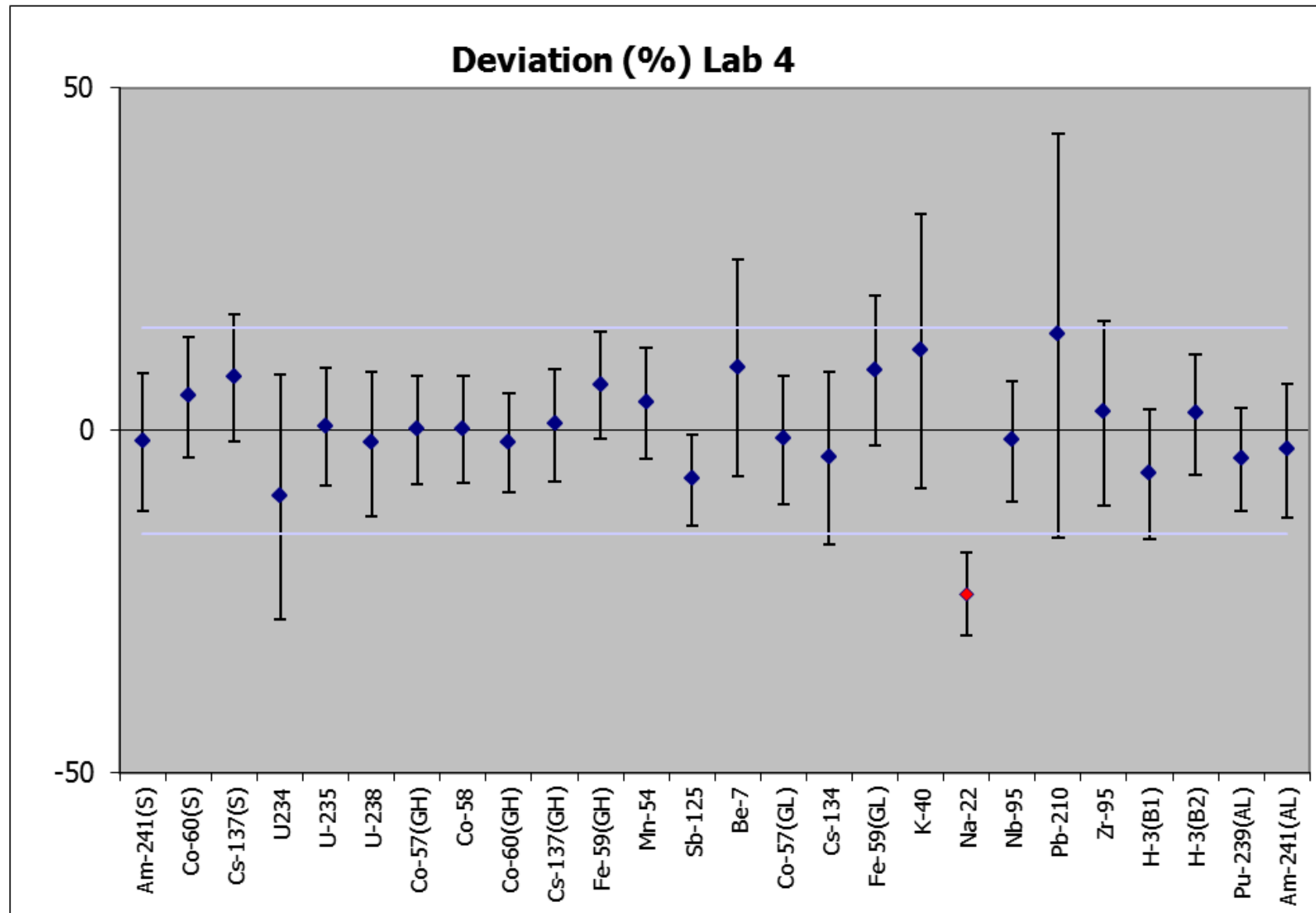
Deviation Plots and Tabulated Results Sorted by Lab Number

All rounding of data was carried at $k=1$ (standard uncertainty). Uncertainties are rounded such that the significant figures of the standard uncertainty lie between 3 and 25. The standard rules of rounding are applied, except in cases where rounding down will reduce the uncertainty by more than 5 %, in which case the uncertainty is rounded up. The reported uncertainties have then been multiplied by a coverage factor $k = 2$, providing a level of confidence of approximately 95 %.



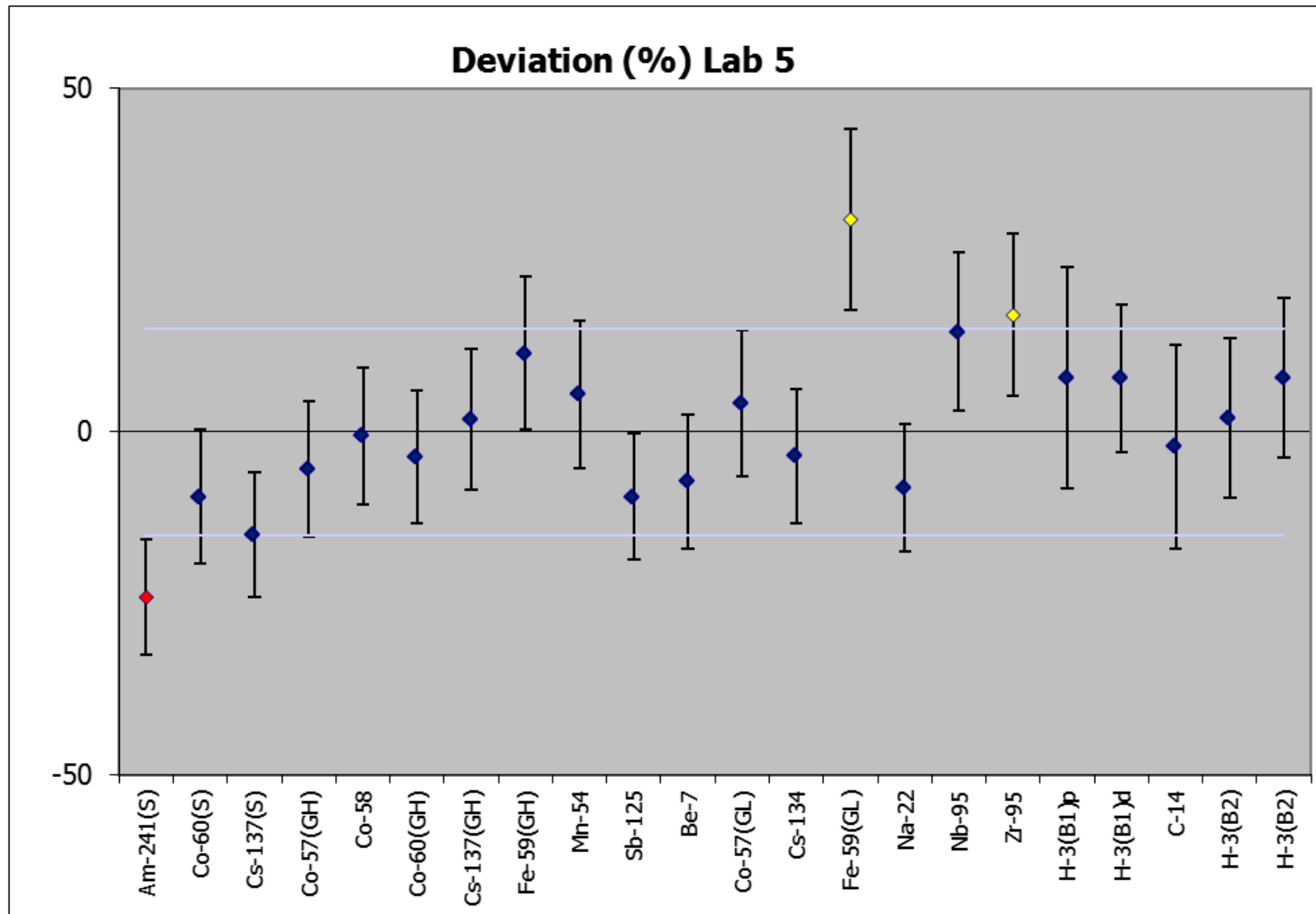
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Nuclide	Lab 1	Assigned Value	Deviation %	zeta	z score
Am-241(S)	6.50 ± 0.40 (± 6 %)	6.8 ± 0.8 (± 10 %)	-4.3	-0.78	-0.74
Am-241(S)	6.62 ± 0.50 (± 8 %)	6.8 ± 0.8 (± 10 %)	-2.6	-0.43	-0.44
Co-60(S)	9.10 ± 0.20 (± 2.2 %)	9.1 ± 0.8 (± 8 %)	-0.4	-0.09	-0.07
Cs-137(S)	9.30 ± 0.40 (± 4.4 %)	9.5 ± 0.8 (± 8 %)	-1.8	-0.43	-0.31
U-234	6.9 ± 2.0 (± 28 %)	7.8 ± 1.0 (± 12 %)	-11.4	-0.82	-1.96
U-235	0.3 ± 0.8 (± 260 %)	0.368 ± 0.030 (± 8 %)	-18.5	-0.17	-3.17
U-238	7.1 ± 2.0 (± 28 %)	7.9 ± 1.0 (± 12 %)	-9.9	-0.72	-1.69
Co-57(GH)	0.84 ± 0.14 (± 16 %)	0.814 ± 0.022 (± 2.8 %)	2.8	0.32	0.47
Co-58	18 ± 6 (± 34 %)	18.54 ± 0.28 (± 1.6 %)	-2.9	-0.18	-0.50
Co-60(GH)	19.6 ± 1.4 (± 8 %)	18.73 ± 0.08 (± 0.42 %)	4.7	1.25	0.80
Cs-137(GH)	7.6 ± 0.6 (± 8 %)	7.15 ± 0.14 (± 2.0 %)	6.2	1.45	1.07
Fe-59(GH)	14 ± 8 (± 60 %)	15.07 ± 0.12 (± 0.8 %)	-7.1	-0.27	-1.22
Mn-54	15.0 ± 2.0 (± 14 %)	14.88 ± 0.12 (± 0.8 %)	0.8	0.12	0.14
Sb-125	2.40 ± 0.20 (± 8 %)	2.297 ± 0.022 (± 1.0 %)	4.5	1.03	0.77
H-3(B1)	2.31 ± 0.10 (± 4.4 %)	1.493 ± 0.020 (± 1.4 %)	54.8	16.00	9.41
C-14	1.110 ± 0.040 (± 3.6 %)	0.807 ± 0.014 (± 1.6 %)	37.5	14.41	6.44
H-3(B2)	0.430 ± 0.040 (± 10 %)	0.3429 ± 0.0048 (± 1.4 %)	25.4	4.32	4.36
Pu-241	0.880 ± 0.040 (± 4.6 %)	0.799 ± 0.018 (± 2.2 %)	10.1	3.70	1.74
gross β(B2)	3.1 ± 0.6 (± 18 %)	3.226 ± 0.014 (± 0.42 %)	-5.1	-0.64	-0.88
Pu-239(AH)	5.90 ± 0.34 (± 6 %)	6.138 ± 0.026 (± 0.42 %)	-3.9	-1.40	-0.67
Am-241(AH)	4.4 ± 0.6 (± 12 %)	3.786 ± 0.016 (± 0.42 %)	16.2	2.36	2.78
Cm-244(AH)	17.4 ± 1.6 (± 10 %)	14.63 ± 0.10 (± 0.6 %)	18.9	3.69	3.25
gross α (AH)	43 ± 8 (± 18 %)	44 ± 12 (± 28 %)	-0.8	-0.05	-0.14



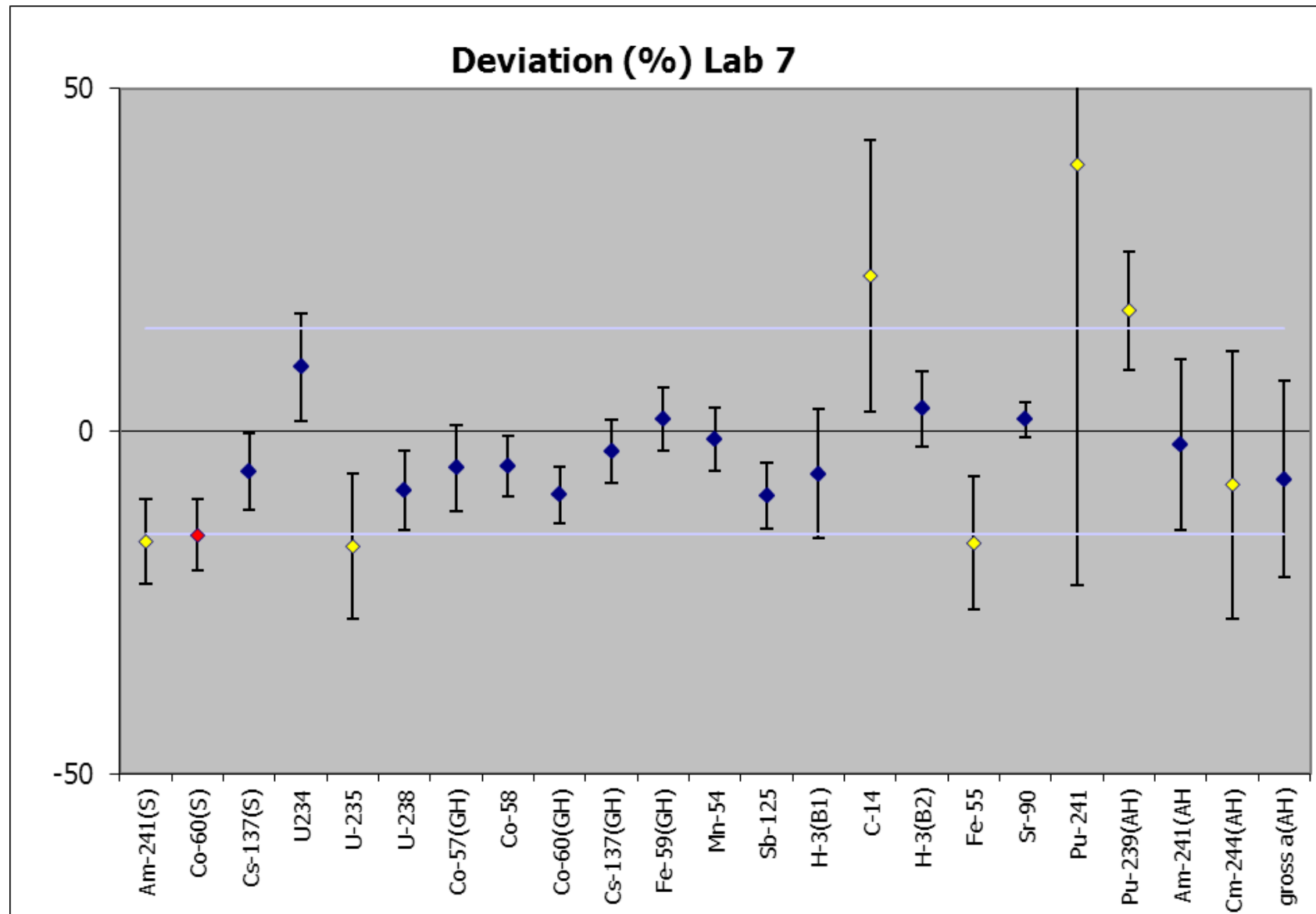
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Nuclide	Lab 4	Assigned Value	Deviation %	zeta	z score
Am-241(S)	6.7 ± 1.2 (± 18 %)	6.8 ± 0.8 (± 10 %)	-1.7	-0.16	-0.29
Co-60(S)	9.6 ± 1.4 (± 16 %)	9.1 ± 0.8 (± 8 %)	4.9	0.57	0.85
Cs-137(S)	10.2 ± 1.6 (± 16 %)	9.5 ± 0.8 (± 8 %)	7.7	0.83	1.32
U-234	7.0 ± 2.6 (± 38 %)	7.8 ± 1.0 (± 12 %)	-9.6	-0.53	-1.65
U-235	0.37 ± 0.06 (± 16 %)	0.368 ± 0.030 (± 8 %)	0.6	0.07	0.10
U-238	7.7 ± 1.4 (± 18 %)	7.9 ± 1.0 (± 12 %)	-1.9	-0.18	-0.33
Co-57(GH)	0.81 ± 0.12 (± 16 %)	0.814 ± 0.022 (± 2.8 %)	0.1	0.01	0.01
Co-58	18.6 ± 2.8 (± 16 %)	18.54 ± 0.28 (± 1.6 %)	0.2	0.02	0.03
Co-60(GH)	18.4 ± 2.8 (± 16 %)	18.73 ± 0.08 (± 0.42 %)	-1.8	-0.25	-0.31
Cs-137(GH)	7.2 ± 1.2 (± 16 %)	7.15 ± 0.14 (± 2.0 %)	0.8	0.10	0.14
Fe-59(GH)	16.1 ± 2.4 (± 14 %)	15.07 ± 0.12 (± 0.8 %)	6.6	0.84	1.13
Mn-54	15.5 ± 2.4 (± 16 %)	14.88 ± 0.12 (± 0.8 %)	4.0	0.50	0.69
Sb-125	2.13 ± 0.30 (± 14 %)	2.297 ± 0.022 (± 1.0 %)	-7.2	-1.07	-1.23
Be-7	19 ± 6 (± 28 %)	17.7 ± 0.6 (± 3.4 %)	9.1	0.58	1.57
Co-57(GL)	2.32 ± 0.44 (± 20 %)	2.352 ± 0.032 (± 1.4 %)	-1.4	-0.15	-0.23
Cs-134	6.0 ± 1.6 (± 26 %)	6.28 ± 0.20 (± 3 %)	-4.0	-0.31	-0.68
Fe-59(GL)	11.8 ± 2.4 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	8.7	0.80	1.50
K-40	19 ± 8 (± 34 %)	16.9 ± 1.6 (± 10 %)	11.6	0.58	2.00
Na-22	8.9 ± 1.4 (± 16 %)	11.74 ± 0.26 (± 2.2 %)	-23.9	-3.94	-4.10
Nb-95	12.8 ± 2.2 (± 18 %)	12.96 ± 0.22 (± 1.8 %)	-1.5	-0.17	-0.27
Pb-210	17 ± 10 (± 60 %)	15.31 ± 0.34 (± 2.2 %)	13.9	0.47	2.39
Zr-95	6.0 ± 1.6 (± 26 %)	5.88 ± 0.10 (± 1.6 %)	2.6	0.19	0.44
H-3(B1)	1.40 ± 0.28 (± 20 %)	1.493 ± 0.020 (± 1.4 %)	-6.3	-0.67	-1.09
H-3(B2)	0.35 ± 0.06 (± 18 %)	0.3429 ± 0.0048 (± 1.4 %)	2.4	0.27	0.40
Pu-239(AL)	17.4 ± 2.8 (± 16 %)	18.18 ± 0.08 (± 0.38 %)	-4.2	-0.57	-0.73
Am-241(AL)	3.4 ± 0.8 (± 20 %)	3.532 ± 0.022 (± 0.6 %)	-2.9	-0.30	-0.50



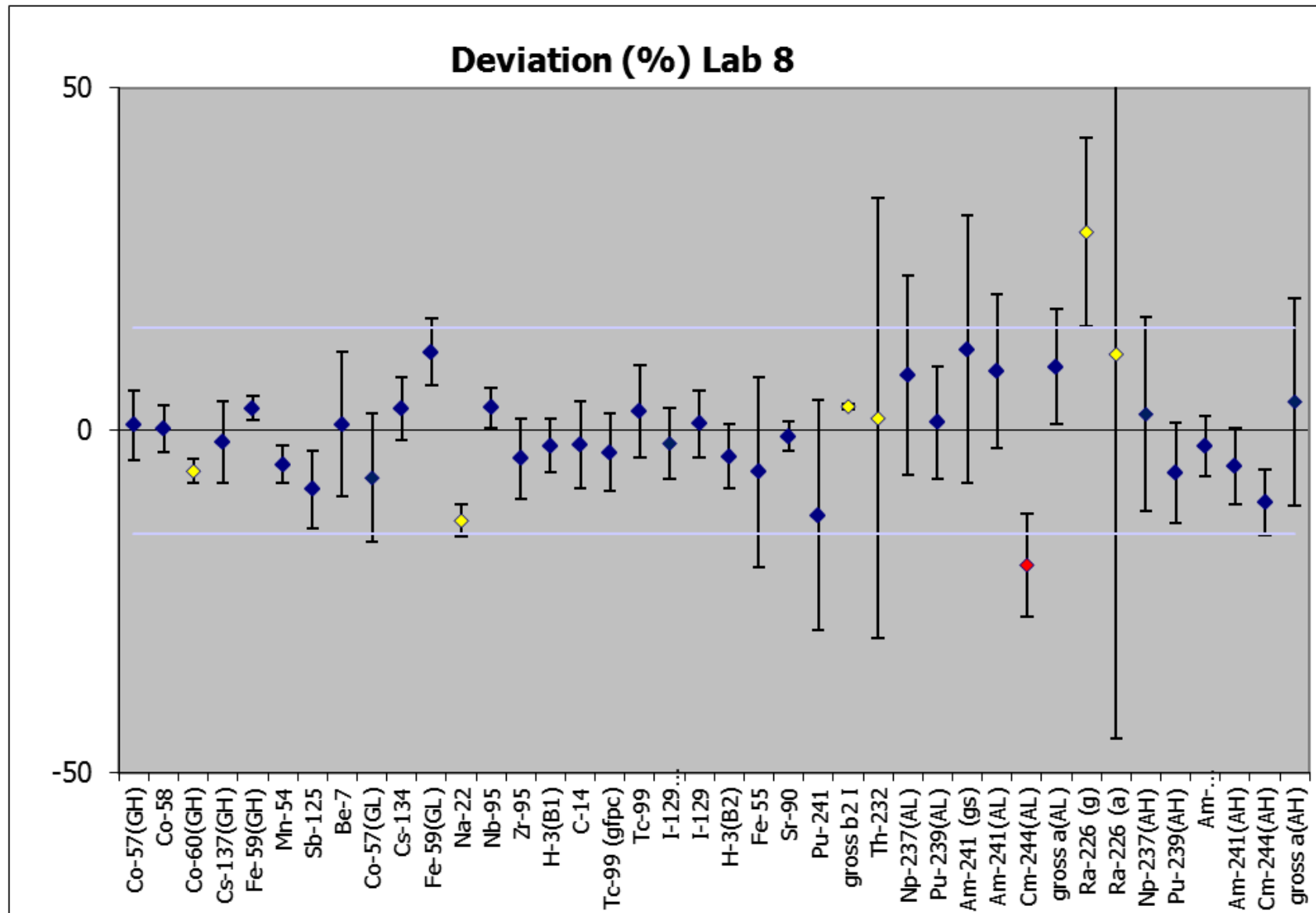
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Nuclide	Lab 5	Assigned Value	deviation	zeta	z score
Am-241(S)	5.2 ± 1.0 (± 20 %)	6.8 ± 0.8 (± 10 %)	-24.1	-2.68	-4.13
Co-60(S)	8.3 ± 1.6 (± 20 %)	9.1 ± 0.8 (± 8 %)	-9.5	-0.96	-1.63
Cs-137(S)	8.0 ± 1.6 (± 20 %)	9.5 ± 0.8 (± 8 %)	-15.0	-1.61	-2.57
Co-57(GH)	0.77 ± 0.16 (± 20 %)	0.814 ± 0.022 (± 2.8 %)	-5.4	-0.54	-0.92
Co-58	18.4 ± 3.6 (± 20 %)	18.54 ± 0.28 (± 1.6 %)	-0.6	-0.06	-0.10
Co-60(GH)	18.0 ± 3.6 (± 20 %)	18.73 ± 0.08 (± 0.42 %)	-3.6	-0.37	-0.62
Cs-137(GH)	7.3 ± 1.4 (± 20 %)	7.15 ± 0.14 (± 2.0 %)	1.8	0.17	0.30
Fe-59(GH)	16.8 ± 3.4 (± 20 %)	15.07 ± 0.12 (± 0.8 %)	11.5	1.03	1.97
Mn-54	15.7 ± 3.2 (± 20 %)	14.88 ± 0.12 (± 0.8 %)	5.5	0.51	0.95
Sb-125	2.08 ± 0.42 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	-9.4	-1.03	-1.62
Be-7	16.4 ± 3.4 (± 20 %)	17.7 ± 0.6 (± 3.4 %)	-7.2	-0.73	-1.24
Co-57(GL)	2.45 ± 0.50 (± 20 %)	2.352 ± 0.032 (± 1.4 %)	4.2	0.39	0.72
Cs-134	6.1 ± 1.2 (± 20 %)	6.28 ± 0.20 (± 3 %)	-3.5	-0.36	-0.60
Fe-59(GL)	14.2 ± 2.8 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	31.0	2.36	5.32
Na-22	10.8 ± 2.2 (± 20 %)	11.74 ± 0.26 (± 2.2 %)	-8.1	-0.88	-1.39
Nb-95	14.8 ± 3.0 (± 20 %)	12.96 ± 0.22 (± 1.8 %)	14.6	1.26	2.50
Zr-95	6.9 ± 1.4 (± 20 %)	5.88 ± 0.10 (± 1.6 %)	17.0	1.45	2.92
H-3(B1)p	1.61 ± 0.48 (± 30 %)	1.493 ± 0.020 (± 1.4 %)	7.9	0.49	1.35
H-3(B1)d	1.61 ± 0.32 (± 20 %)	1.493 ± 0.020 (± 1.4 %)	7.9	0.73	1.35
C-14	0.79 ± 0.24 (± 30 %)	0.807 ± 0.014 (± 1.6 %)	-2.1	-0.14	-0.37
H-3(B2)	0.35 ± 0.08 (± 22 %)	0.3429 ± 0.0048 (± 1.4 %)	2.1	0.18	0.35
H-3(B2)	0.37 ± 0.08 (± 22 %)	0.3429 ± 0.0048 (± 1.4 %)	7.9	0.68	1.36



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Nuclide	Lab 7	Assigned Value	Deviation %	zeta	z score
Am-241(S)	5.7 ± 0.6 (± 10 %)	6.8 ± 0.8 (± 10 %)	-16.1	-2.65	-2.77
Co-60(S)	7.8 ± 0.8 (± 10 %)	9.1 ± 0.8 (± 8 %)	-14.9	-2.72	-2.57
Cs-137(S)	8.9 ± 0.8 (± 10 %)	9.5 ± 0.8 (± 8 %)	-5.9	-1.05	-1.01
U-234	8.5 ± 0.8 (± 10 %)	7.8 ± 1.0 (± 12 %)	9.0	1.25	1.55
U-235	0.31 ± 0.08 (± 22 %)	0.368 ± 0.030 (± 8 %)	-16.8	-1.63	-2.89
U-238	7.1 ± 0.8 (± 10 %)	7.9 ± 1.0 (± 12 %)	-9.6	-1.43	-1.65
Co-57(GH)	0.77 ± 0.10 (± 14 %)	0.814 ± 0.022 (± 2.8 %)	-5.4	-0.85	-0.92
Co-58	17.6 ± 1.6 (± 10 %)	18.54 ± 0.28 (± 1.6 %)	-5.1	-1.17	-0.88
Co-60(GH)	17.0 ± 1.6 (± 10 %)	18.73 ± 0.08 (± 0.42 %)	-9.3	-2.25	-1.59
Cs-137(GH)	6.9 ± 0.8 (± 10 %)	7.15 ± 0.14 (± 2.0 %)	-3.0	-0.65	-0.51
Fe-59(GH)	15.3 ± 1.4 (± 10 %)	15.07 ± 0.12 (± 0.8 %)	1.8	0.38	0.30
Mn-54	14.7 ± 1.4 (± 10 %)	14.88 ± 0.12 (± 0.8 %)	-1.2	-0.26	-0.20
Sb-125	2.08 ± 0.22 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	-9.4	-1.96	-1.62
H-3(B1)	1.40 ± 0.28 (± 20 %)	1.493 ± 0.020 (± 1.4 %)	-6.2	-0.66	-1.07
C-14	0.99 ± 0.32 (± 32 %)	0.807 ± 0.014 (± 1.6 %)	22.6	1.14	3.89
H-3(B2)	0.354 ± 0.038 (± 12 %)	0.3429 ± 0.0048 (± 1.4 %)	3.2	0.58	0.55
Fe-55	1.22 ± 0.28 (± 22 %)	1.46 ± 0.06 (± 3.6 %)	-16.3	-1.67	-2.81
Sr-90	1.64 ± 0.08 (± 5 %)	1.613 ± 0.008 (± 0.42 %)	1.7	0.66	0.29
Pu-241	1.1 ± 1.0 (± 100 %)	0.799 ± 0.018 (± 2.2 %)	38.9	0.63	6.68
Pu-239(AH)	7.2 ± 1.2 (± 14 %)	6.138 ± 0.026 (± 0.42 %)	17.6	2.04	3.03
Am-241(AH)	3.7 ± 1.0 (± 26 %)	3.786 ± 0.016 (± 0.42 %)	-2.0	-0.16	-0.35
Cm-244(AH)	13 ± 6 (± 42 %)	14.63 ± 0.10 (± 0.6 %)	-7.8	-0.40	-1.34
gross α (AH)	40.6 ± 4.4 (± 12 %)	44 ± 12 (± 28 %)	-7.0	-0.46	-1.20

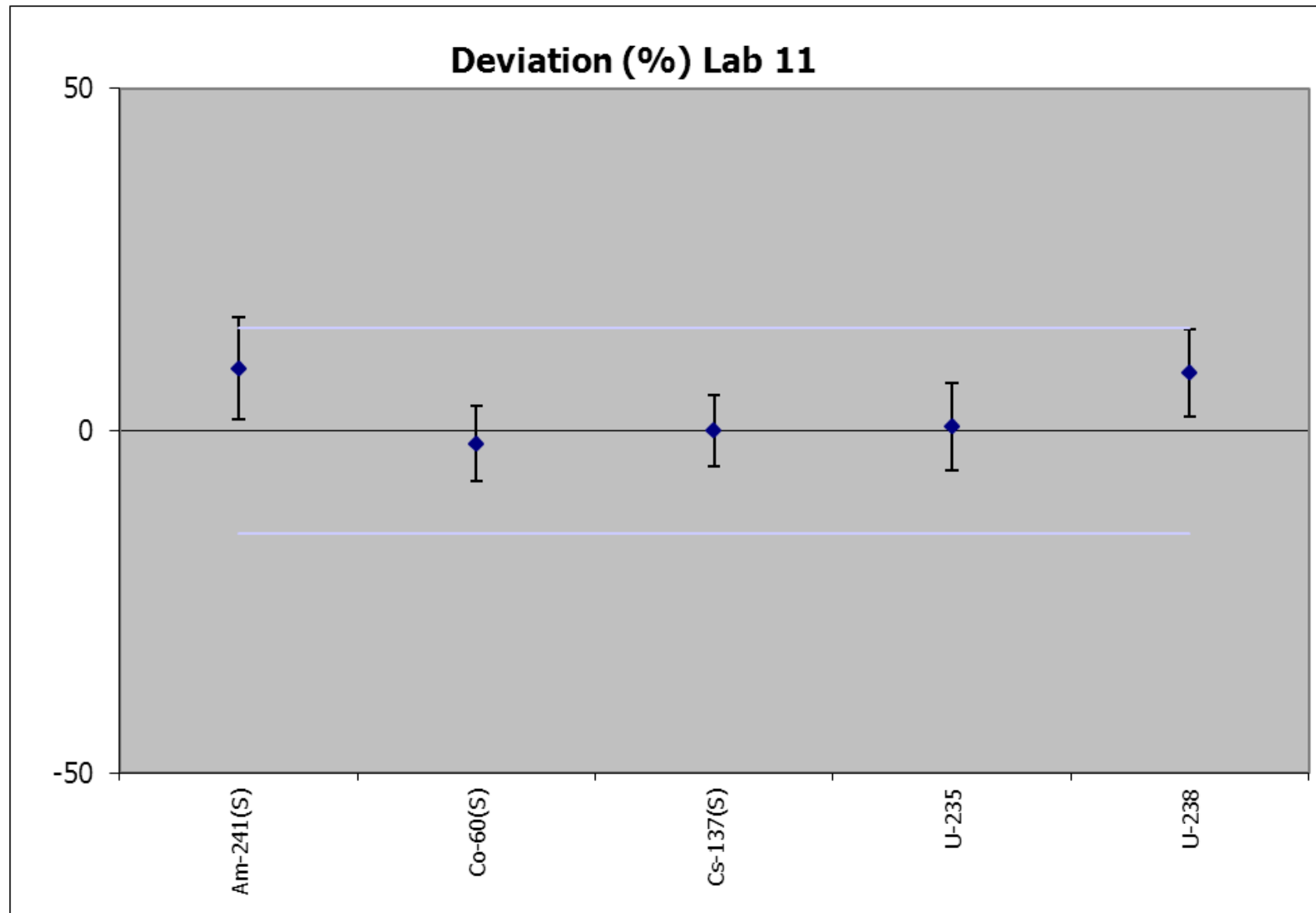


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Nuclide	Lab 8	Assigned Value	Deviation %	zeta	z score
Co-57(GH)	0.82 ± 0.08 (± 10 %)	0.814 ± 0.022 (± 2.8 %)	0.8	0.16	0.14
Co-58	18.6 ± 1.2 (± 8 %)	18.54 ± 0.28 (± 1.6 %)	0.3	0.09	0.05
Co-60(GH)	17.6 ± 0.8 (± 3.6 %)	18.73 ± 0.08 (± 0.42 %)	-5.9	-3.43	-1.01
Cs-137(GH)	7.0 ± 0.8 (± 12 %)	7.15 ± 0.14 (± 2.0 %)	-1.7	-0.29	-0.30
Fe-59(GH)	15.57 ± 0.50 (± 3.2 %)	15.07 ± 0.12 (± 0.8 %)	3.3	1.93	0.57
Mn-54	14.1 ± 0.8 (± 6 %)	14.88 ± 0.12 (± 0.8 %)	-4.9	-1.82	-0.85
Sb-125	2.10 ± 0.26 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	-8.6	-1.51	-1.47
Be-7	17.9 ± 3.6 (± 20 %)	17.7 ± 0.6 (± 3.4 %)	1.0	0.09	0.17
Co-57(GL)	2.19 ± 0.44 (± 20 %)	2.352 ± 0.032 (± 1.4 %)	-6.9	-0.73	-1.18
Cs-134	6.5 ± 0.6 (± 8 %)	6.28 ± 0.20 (± 3 %)	3.2	0.70	0.55
Fe-59(GL)	12.1 ± 1.0 (± 10 %)	10.85 ± 0.22 (± 2.0 %)	11.5	2.35	1.98
Na-22	10.2 ± 0.5 (± 5 %)	11.74 ± 0.26 (± 2.2 %)	-13.1	-5.52	-2.26
Nb-95	13.4 ± 0.8 (± 6 %)	12.96 ± 0.22 (± 1.8 %)	3.4	1.16	0.58
Zr-95	5.6 ± 0.8 (± 12 %)	5.88 ± 0.10 (± 1.6 %)	-4.1	-0.70	-0.70
H-3(B1)	1.46 ± 0.12 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	-2.2	-0.56	-0.37
C-14	0.79 ± 0.10 (± 14 %)	0.807 ± 0.014 (± 1.6 %)	-2.0	-0.32	-0.34
Tc-99 (gfpc)	1.58 ± 0.18 (± 12 %)	1.633 ± 0.008 (± 0.44 %)	-3.2	-0.57	-0.55
Tc-99	1.68 ± 0.22 (± 14 %)	1.633 ± 0.008 (± 0.44 %)	2.9	0.43	0.50
I-129 (LEPS)	0.384 ± 0.040 (± 10 %)	0.3909 ± 0.0040 (± 1.0 %)	-1.9	-0.36	-0.32
I-129	0.395 ± 0.038 (± 10 %)	0.3909 ± 0.0040 (± 1.0 %)	1.0	0.21	0.18
H-3(B2)	0.330 ± 0.032 (± 10 %)	0.3429 ± 0.0048 (± 1.4 %)	-3.8	-0.81	-0.65
Fe-55	1.37 ± 0.40 (± 30 %)	1.46 ± 0.06 (± 3.6 %)	-6.1	-0.44	-1.04
Sr-90	1.60 ± 0.08 (± 4.4 %)	1.613 ± 0.008 (± 0.42 %)	-0.8	-0.37	-0.14
Pu-241	0.70 ± 0.26 (± 38 %)	0.799 ± 0.018 (± 2.2 %)	-12.4	-0.74	-2.13
gross β(B2)	3.340 ± 0.024 (± 0.8 %)	3.226 ± 0.014 (± 0.42 %)	3.5	8.44	0.61
Th-232	3.8 ± 2.4 (± 80 %)	3.76 ± 0.08 (± 2.0 %)	1.8	0.06	0.31
Np-237(AL)	19 ± 6 (± 26 %)	17.95 ± 0.36 (± 2.0 %)	8.1	0.56	1.39
Pu-239(AL)	18.4 ± 3.0 (± 16 %)	18.18 ± 0.08 (± 0.38 %)	1.2	0.15	0.21
Am-241 (gs)	4.0 ± 1.4 (± 34 %)	3.532 ± 0.022 (± 0.6 %)	11.8	0.61	2.03
Am-241(AL)	3.8 ± 0.8 (± 20 %)	3.532 ± 0.022 (± 0.6 %)	8.7	0.78	1.50
Cm-244(AL)	8.8 ± 1.6 (± 18 %)	10.97 ± 0.08 (± 0.8 %)	-19.6	-2.62	-3.37
gross α (AL)	70.8 ± 1.6 (± 2.4 %)	65 ± 10 (± 16 %)	9.4	1.22	1.61
Ra-226 (g)	4.9 ± 1.0 (± 22 %)	3.81 ± 0.10 (± 2.6 %)	29.0	2.10	4.98

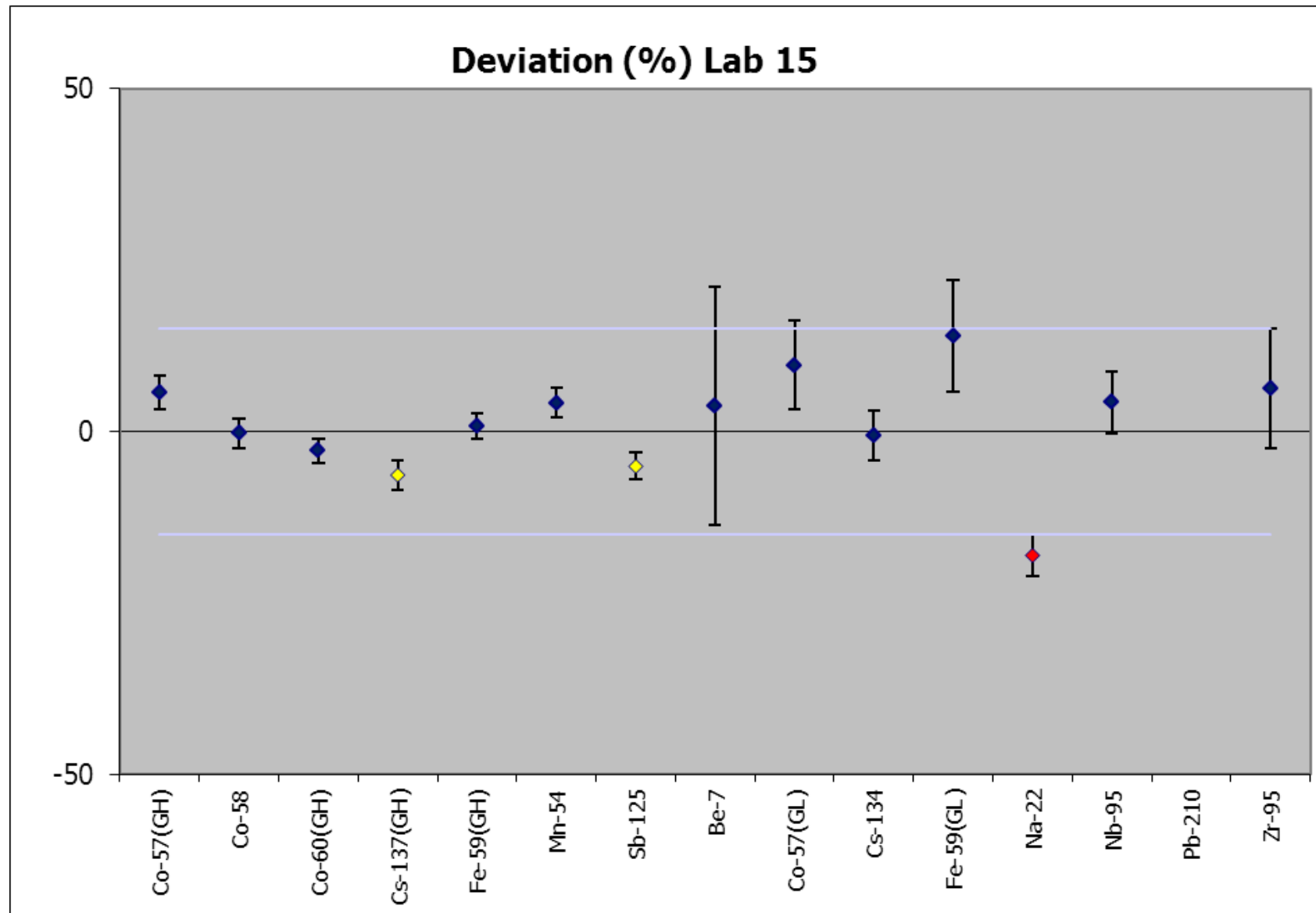
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Nuclide	Lab 8	Assigned Value	Deviation %	zeta	z score
Ra-226 (a)	4.2 ± 4.2 (± 100 %)	3.81 ± 0.10 (± 2.6 %)	11.2	0.20	1.92
Np-237(AH)	11.2 ± 3.0 (± 28 %)	10.94 ± 0.22 (± 2.0 %)	2.4	0.17	0.42
Pu-239(AH)	5.8 ± 1.0 (± 16 %)	6.138 ± 0.026 (± 0.42 %)	-6.2	-0.83	-1.06
Am-241(leps)	3.70 ± 0.34 (± 10 %)	3.786 ± 0.016 (± 0.42 %)	-2.3	-0.52	-0.39
Am-241(AH)	3.59 ± 0.42 (± 12 %)	3.786 ± 0.016 (± 0.42 %)	-5.2	-0.95	-0.89
Cm-244(AH)	13.1 ± 1.4 (± 12 %)	14.63 ± 0.10 (± 0.6 %)	-10.5	-2.17	-1.80
gross α (AH)	45.5 ± 1.4 (± 2.8 %)	44 ± 12 (± 28 %)	4.2	0.29	0.73



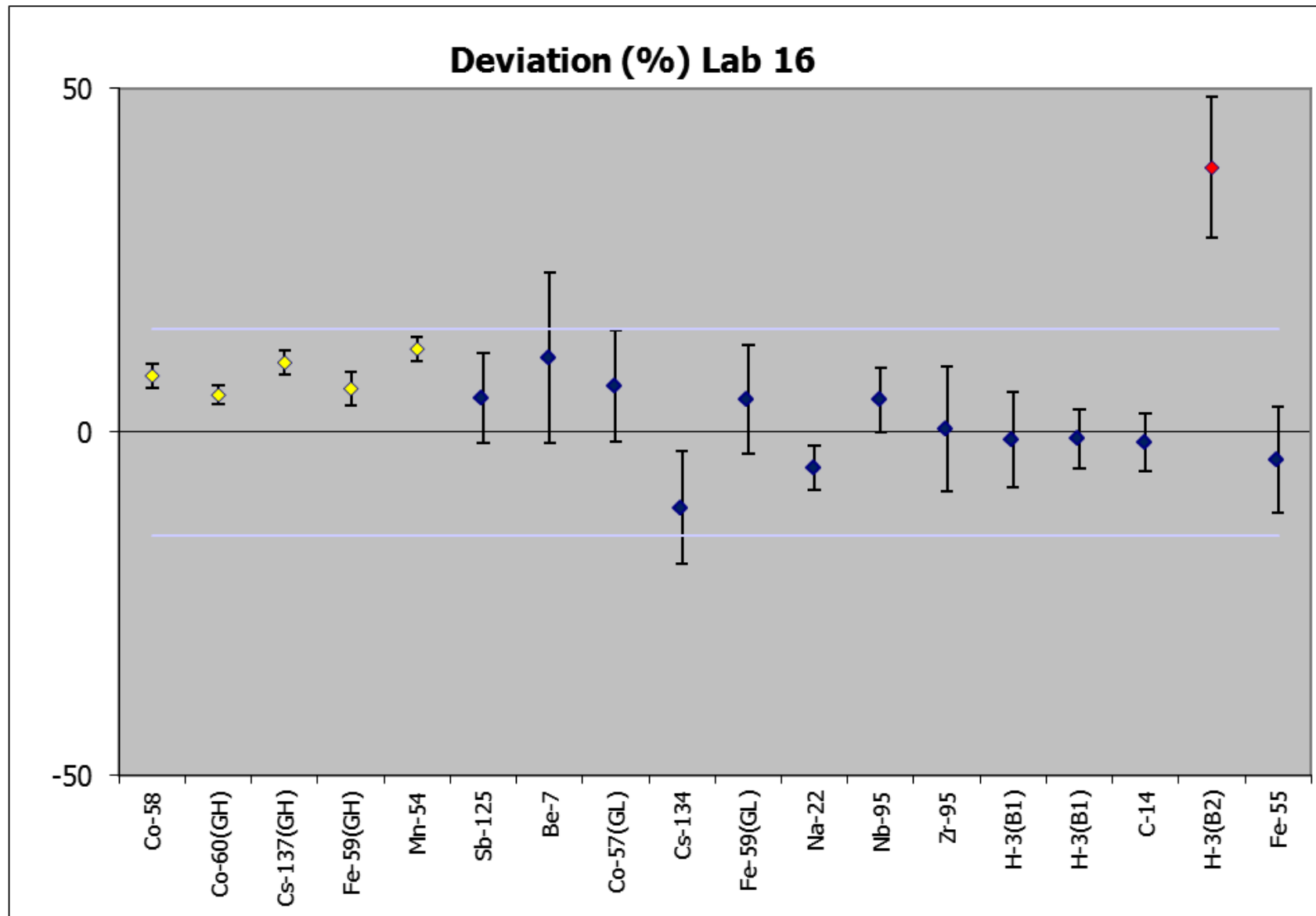
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Nuclide	Lab 11	Assigned Value	Deviation %	zeta	z score
Am-241(S)	7.4 ± 0.6 ($\pm 8 \%$)	6.8 ± 0.8 ($\pm 10 \%$)	9.1	1.47	1.56
Co-60(S)	9.0 ± 0.8 ($\pm 8 \%$)	9.1 ± 0.8 ($\pm 8 \%$)	-1.6	-0.30	-0.27
Cs-137(S)	9.5 ± 0.8 ($\pm 8 \%$)	9.5 ± 0.8 ($\pm 8 \%$)	-0.1	-0.02	-0.02
U-235	0.370 ± 0.020 ($\pm 6 \%$)	0.368 ± 0.030 ($\pm 8 \%$)	0.6	0.12	0.10
U-238	8.4 ± 0.8 ($\pm 8 \%$)	7.9 ± 1.0 ($\pm 12 \%$)	7.3	1.08	1.25



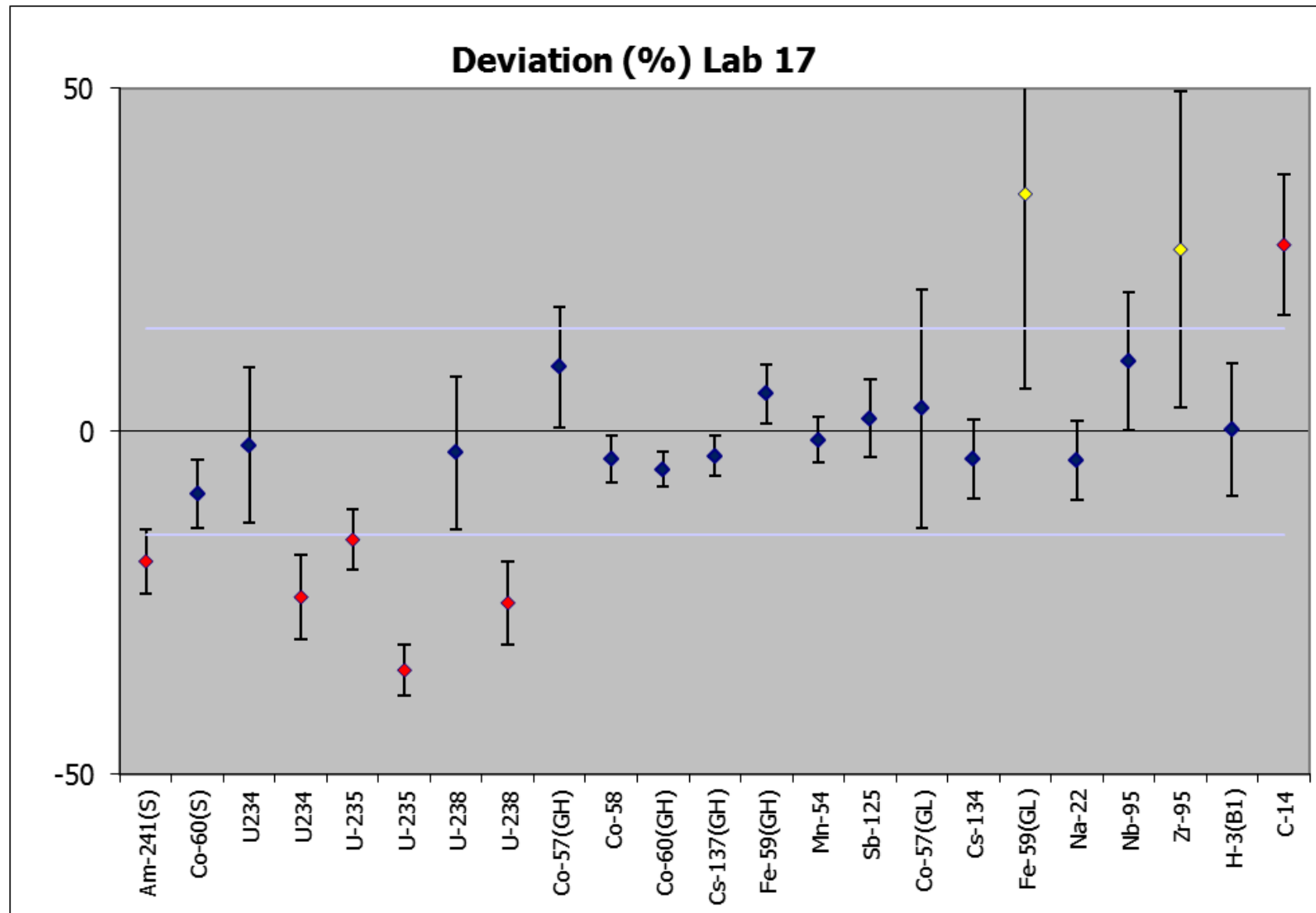
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Nuclide	Lab 15	Assigned Value	Deviation %	zeta	z score
Co-57(GH)	0.860 ± 0.032 (± 3.6 %)	0.814 ± 0.022 (± 2.8 %)	5.7	2.41	0.98
Co-58	18.5 ± 0.8 (± 4.0 %)	18.54 ± 0.28 (± 1.6 %)	-0.2	-0.11	-0.04
Co-60(GH)	18.2 ± 0.8 (± 3.6 %)	18.73 ± 0.08 (± 0.42 %)	-2.8	-1.57	-0.48
Cs-137(GH)	6.70 ± 0.28 (± 4.0 %)	7.15 ± 0.14 (± 2.0 %)	-6.4	-2.95	-1.09
Fe-59(GH)	15.2 ± 0.6 (± 3.6 %)	15.07 ± 0.12 (± 0.8 %)	0.8	0.45	0.14
Mn-54	15.5 ± 0.8 (± 4.0 %)	14.88 ± 0.12 (± 0.8 %)	4.2	1.94	0.72
Sb-125	2.18 ± 0.10 (± 4.0 %)	2.297 ± 0.022 (± 1.0 %)	-5.1	-2.58	-0.87
Be-7	18 ± 6 (± 34 %)	17.7 ± 0.6 (± 3.4 %)	3.7	0.21	0.63
Co-57(GL)	2.58 ± 0.30 (± 12 %)	2.352 ± 0.032 (± 1.4 %)	9.7	1.51	1.66
Cs-134	6.24 ± 0.42 (± 8 %)	6.28 ± 0.20 (± 3 %)	-0.6	-0.18	-0.11
Fe-59(GL)	12.4 ± 1.8 (± 14 %)	10.85 ± 0.22 (± 2.0 %)	13.9	1.73	2.39
Na-22	9.6 ± 0.8 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-18.1	-5.71	-3.10
Nb-95	13.5 ± 1.2 (± 10 %)	12.96 ± 0.22 (± 1.8 %)	4.4	0.98	0.75
Pb-210	1.50 ± 0.26 (± 18 %)	15.31 ± 0.34 (± 2.2 %)	-90.2	-64.72	-15.49
Zr-95	6.2 ± 1.0 (± 16 %)	5.88 ± 0.10 (± 1.6 %)	6.3	0.72	1.08



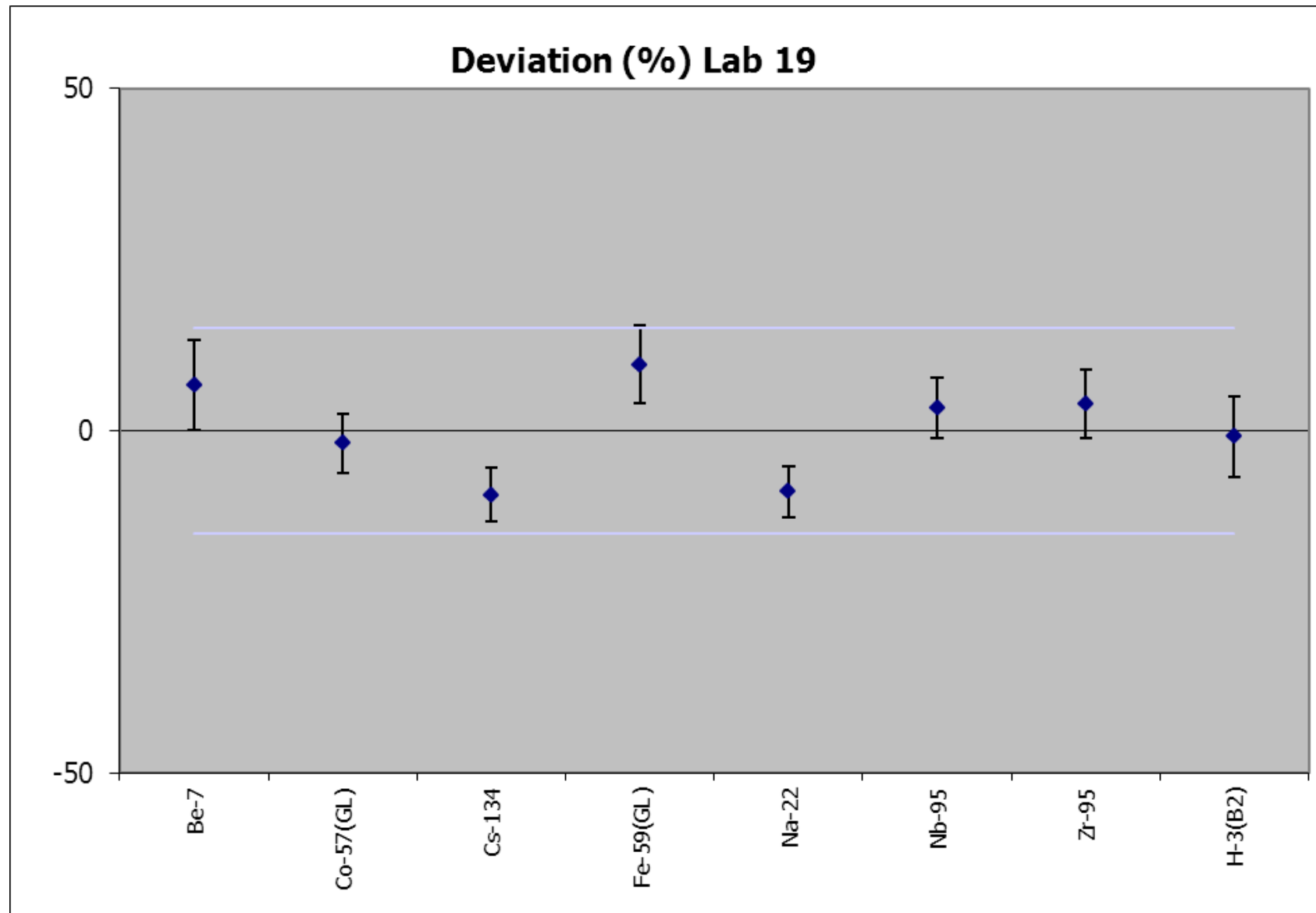
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Nuclide	Lab 16	Assigned Value	Deviation	zeta	z score
Co-58	20.1 ± 0.6 (± 3 %)	18.54 ± 0.28 (± 1.6 %)	8.2	4.58	1.41
Co-60(GH)	19.7 ± 0.6 (± 2.6 %)	18.73 ± 0.08 (± 0.42 %)	5.4	3.86	0.93
Cs-137(GH)	7.88 ± 0.20 (± 2.6 %)	7.15 ± 0.14 (± 2.0 %)	10.1	5.92	1.74
Fe-59(GH)	16.0 ± 0.8 (± 4.4 %)	15.07 ± 0.12 (± 0.8 %)	6.3	2.69	1.09
Mn-54	16.68 ± 0.50 (± 3 %)	14.88 ± 0.12 (± 0.8 %)	12.1	7.05	2.08
Sb-125	2.41 ± 0.30 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	4.9	0.75	0.85
Be-7	19.6 ± 4.4 (± 22 %)	17.7 ± 0.6 (± 3.4 %)	10.8	0.88	1.86
Co-57(GL)	2.51 ± 0.38 (± 16 %)	2.352 ± 0.032 (± 1.4 %)	6.7	0.83	1.15
Cs-134	5.6 ± 1.0 (± 18 %)	6.28 ± 0.20 (± 3 %)	-11.0	-1.33	-1.89
Fe-59(GL)	11.4 ± 1.8 (± 16 %)	10.85 ± 0.22 (± 2.0 %)	4.7	0.59	0.81
Na-22	11.1 ± 0.8 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-5.1	-1.58	-0.88
Nb-95	13.6 ± 1.2 (± 10 %)	12.96 ± 0.22 (± 1.8 %)	4.7	1.00	0.81
Zr-95	5.9 ± 1.2 (± 18 %)	5.88 ± 0.10 (± 1.6 %)	0.5	0.06	0.09
H-3(B1)	1.48 ± 0.20 (± 14 %)	1.493 ± 0.020 (± 1.4 %)	-1.1	-0.16	-0.19
H-3(B1)	1.48 ± 0.14 (± 10 %)	1.493 ± 0.020 (± 1.4 %)	-1.0	-0.22	-0.17
C-14	0.80 ± 0.08 (± 8 %)	0.807 ± 0.014 (± 1.6 %)	-1.5	-0.36	-0.26
H-3(B2)	0.48 ± 0.08 (± 14 %)	0.3429 ± 0.0048 (± 1.4 %)	38.5	3.76	6.61
Fe-55	1.40 ± 0.22 (± 16 %)	1.46 ± 0.06 (± 3.6 %)	-4.0	-0.52	-0.69



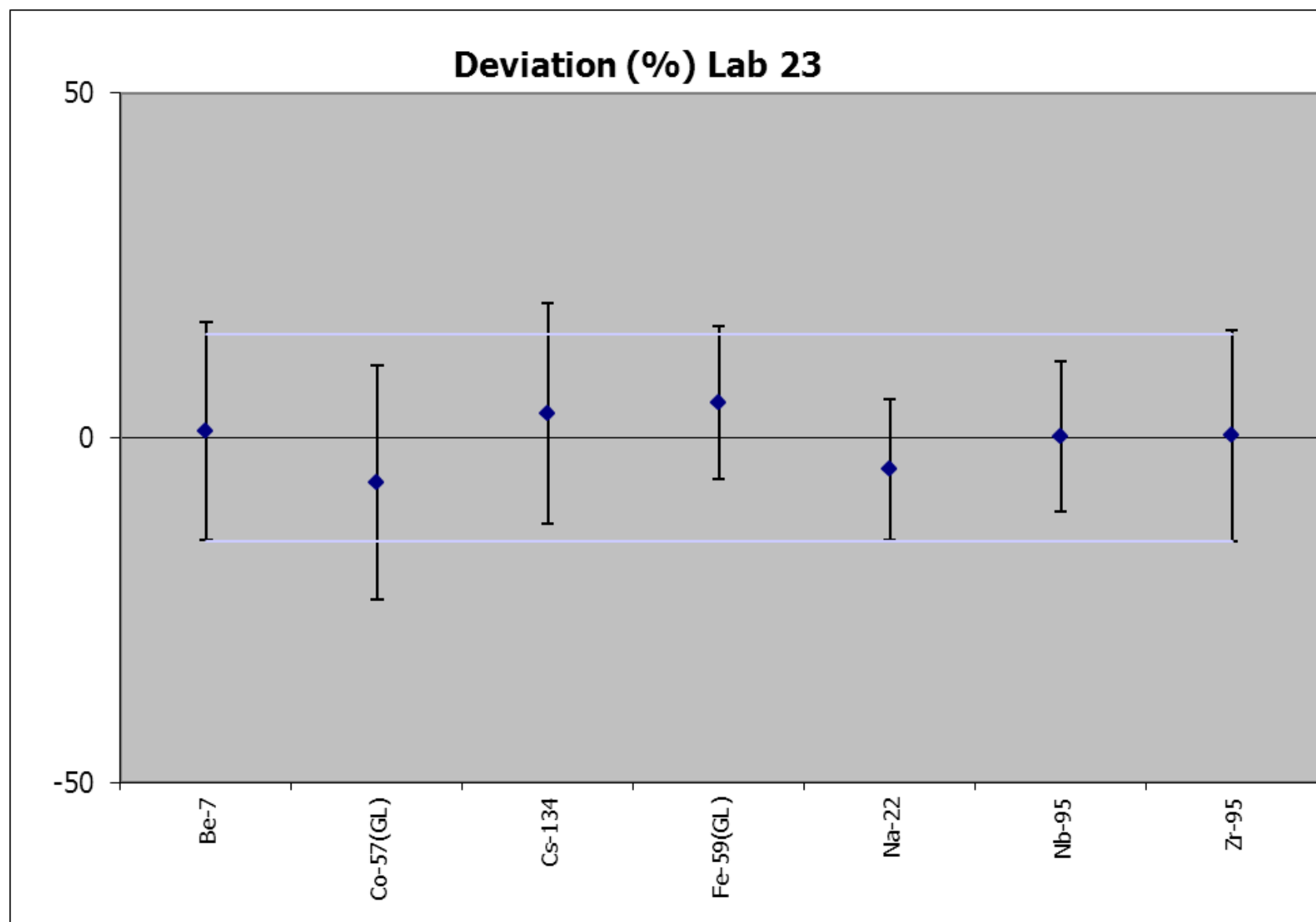
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Nuclide	Lab 17	Assigned Value	Deviation	zeta	z score
Am-241(S)	5.51 ± 0.36 (± 8 %)	6.8 ± 0.8 (± 10 %)	-18.9	-3.49	-3.25
Co-60(S)	8.3 ± 0.8 (± 8 %)	9.1 ± 0.8 (± 8 %)	-9.1	-1.73	-1.57
U-234	7.6 ± 1.6 (± 20 %)	7.8 ± 1.0 (± 12 %)	-2.0	-0.18	-0.35
U-234	5.9 ± 0.8 (± 12 %)	7.8 ± 1.0 (± 12 %)	-24.1	-3.38	-4.14
U-235	0.310 ± 0.020 (± 8 %)	0.368 ± 0.030 (± 8 %)	-15.7	-3.27	-2.70
U-235	0.240 ± 0.020 (± 8 %)	0.368 ± 0.030 (± 8 %)	-34.8	-7.21	-5.97
U-238	7.6 ± 1.6 (± 20 %)	7.9 ± 1.0 (± 12 %)	-3.1	-0.28	-0.54
U-238	5.9 ± 0.8 (± 12 %)	7.9 ± 1.0 (± 12 %)	-25.0	-3.55	-4.29
Co-57(GH)	0.89 ± 0.14 (± 16 %)	0.814 ± 0.022 (± 2.8 %)	9.4	1.08	1.61
Co-58	17.8 ± 1.2 (± 8 %)	18.54 ± 0.28 (± 1.6 %)	-4.0	-1.19	-0.69
Co-60(GH)	17.7 ± 1.0 (± 6 %)	18.73 ± 0.08 (± 0.42 %)	-5.5	-2.09	-0.94
Cs-137(GH)	6.90 ± 0.40 (± 6 %)	7.15 ± 0.14 (± 2.0 %)	-3.6	-1.20	-0.61
Fe-59(GH)	15.9 ± 1.4 (± 8 %)	15.07 ± 0.12 (± 0.8 %)	5.5	1.29	0.94
Mn-54	14.7 ± 1.0 (± 8 %)	14.88 ± 0.12 (± 0.8 %)	-1.2	-0.37	-0.20
Sb-125	2.34 ± 0.26 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	1.9	0.33	0.32
Co-57(GL)	2.4 ± 0.8 (± 34 %)	2.352 ± 0.032 (± 1.4 %)	3.3	0.19	0.57
Cs-134	6.0 ± 0.8 (± 12 %)	6.28 ± 0.20 (± 3 %)	-4.0	-0.69	-0.68
Fe-59(GL)	15 ± 6 (± 42 %)	10.85 ± 0.22 (± 2.0 %)	34.6	1.22	5.95
Na-22	11.2 ± 1.4 (± 12 %)	11.74 ± 0.26 (± 2.2 %)	-4.2	-0.73	-0.72
Nb-95	14.3 ± 2.6 (± 18 %)	12.96 ± 0.22 (± 1.8 %)	10.2	1.01	1.75
Zr-95	7.4 ± 2.8 (± 36 %)	5.88 ± 0.10 (± 1.6 %)	26.6	1.16	4.56
H-3(B1)	1.50 ± 0.28 (± 20 %)	1.493 ± 0.020 (± 1.4 %)	0.3	0.03	0.05
C-14	1.03 ± 0.16 (± 16 %)	0.807 ± 0.014 (± 1.6 %)	27.2	2.64	4.68



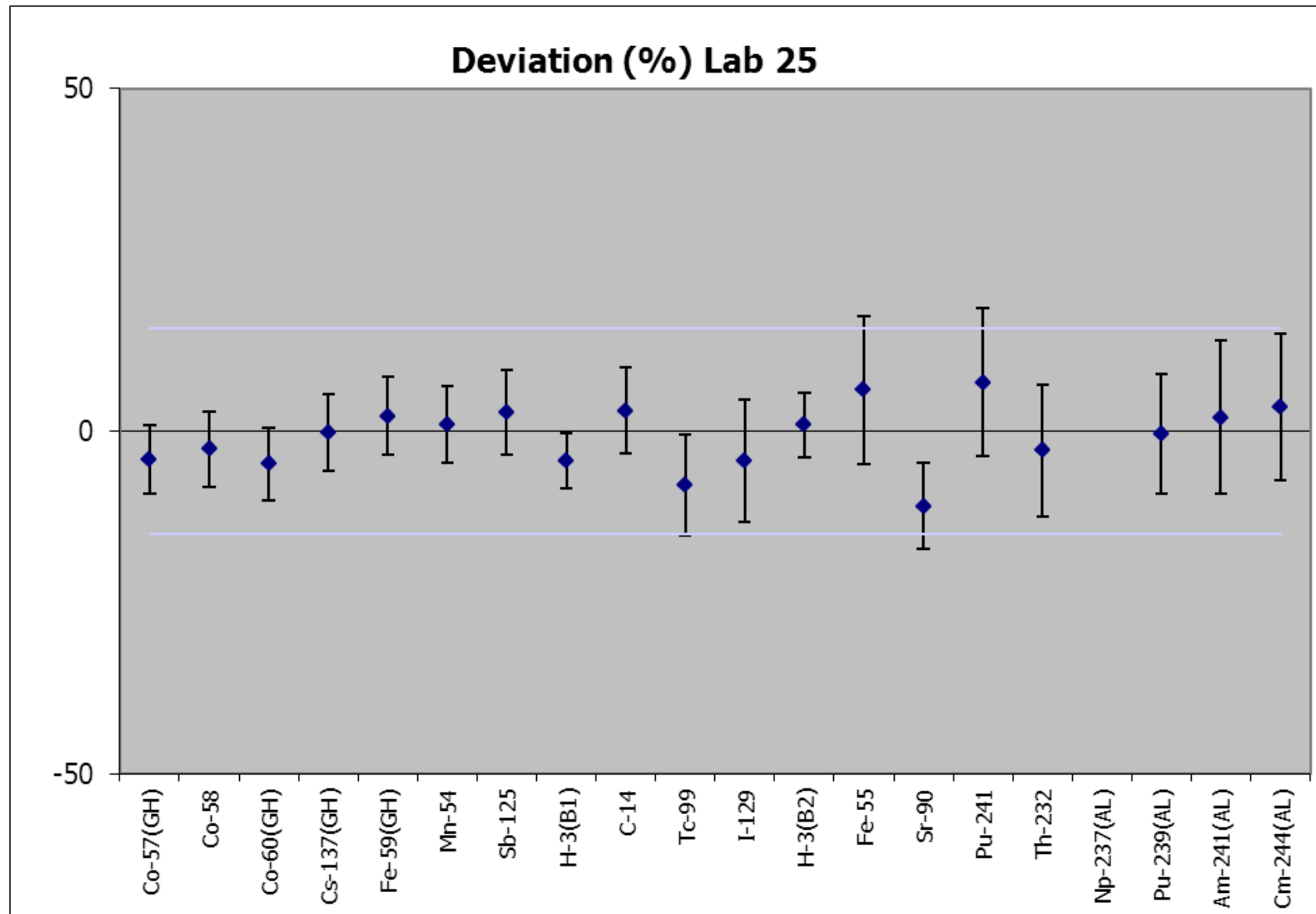
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Nuclide	Lab 19	Assigned Value	Deviation	zeta	z score
Be-7	18.9 ± 2.2 (± 12 %)	17.7 ± 0.6 (± 3.4 %)	6.6	1.01	1.14
Co-57(GL)	2.31 ± 0.20 (± 10 %)	2.352 ± 0.032 (± 1.4 %)	-1.8	-0.41	-0.31
Cs-134	5.69 ± 0.46 (± 8 %)	6.28 ± 0.20 (± 3 %)	-9.4	-2.37	-1.61
Fe-59(GL)	11.9 ± 1.2 (± 10 %)	10.85 ± 0.22 (± 2.0 %)	9.7	1.69	1.66
Na-22	10.7 ± 0.8 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-8.9	-2.38	-1.52
Nb-95	13.4 ± 1.2 (± 8 %)	12.96 ± 0.22 (± 1.8 %)	3.4	0.77	0.58
Zr-95	6.1 ± 0.6 (± 10 %)	5.88 ± 0.10 (± 1.6 %)	3.9	0.79	0.68
H-3(B2)	0.340 ± 0.040 (± 12 %)	0.3429 ± 0.0048 (± 1.4 %)	-0.9	-0.14	-0.15



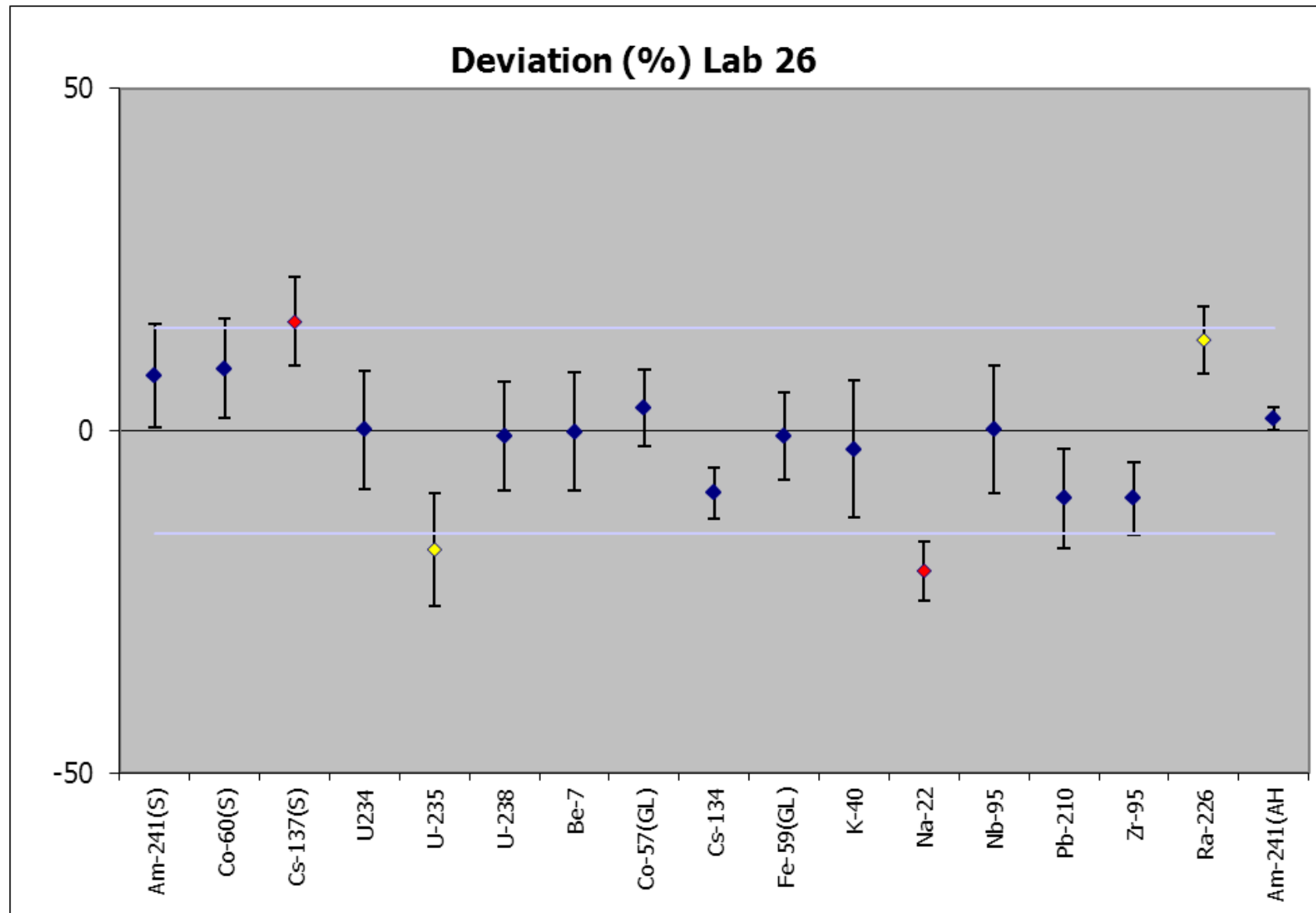
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Nuclide	Lab 23	Assigned Value	Deviation	zeta	z score
Be-7	18 ± 6 (± 32 %)	17.7 ± 0.6 (± 3.4 %)	1.0	0.06	0.17
Co-57(GL)	2.2 ± 0.8 (± 36 %)	2.352 ± 0.032 (± 1.4 %)	-6.5	-0.38	-1.11
Cs-134	6.5 ± 2.0 (± 30 %)	6.28 ± 0.20 (± 3 %)	3.5	0.22	0.60
Fe-59(GL)	11.4 ± 2.4 (± 22 %)	10.85 ± 0.22 (± 2.0 %)	5.1	0.46	0.87
Na-22	11.2 ± 2.4 (± 22 %)	11.74 ± 0.26 (± 2.2 %)	-4.6	-0.45	-0.79
Nb-95	13.0 ± 2.8 (± 22 %)	12.96 ± 0.22 (± 1.8 %)	0.3	0.03	0.05
Zr-95	5.9 ± 1.8 (± 30 %)	5.88 ± 0.10 (± 1.6 %)	0.4	0.02	0.06



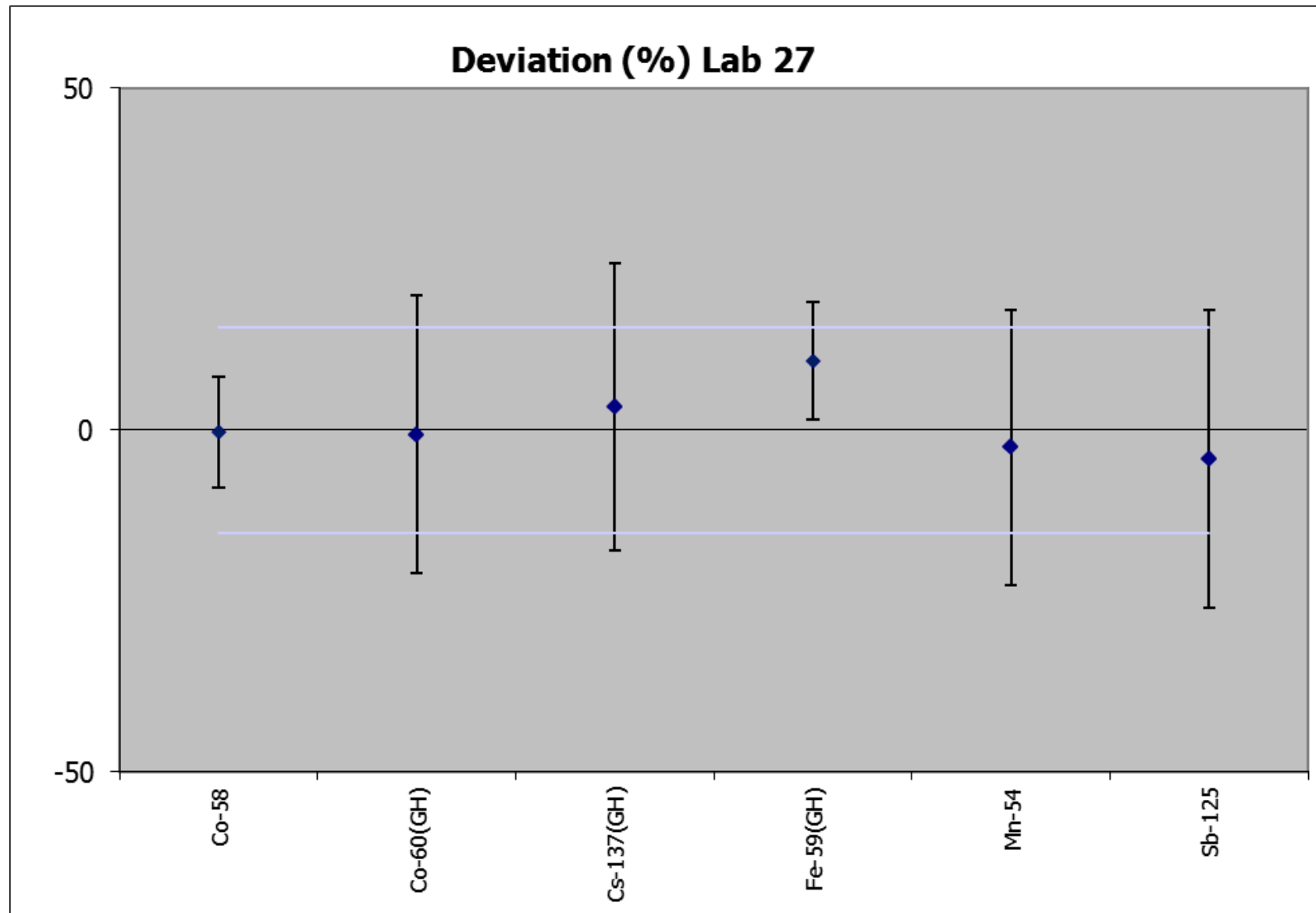
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Nuclide	Lab 25	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.78 ± 0.08 (± 10 %)	0.814 ± 0.022 (± 2.8 %)	-4.1	-0.81	-0.71
Co-58	18.1 ± 2.0 (± 12 %)	18.54 ± 0.28 (± 1.6 %)	-2.6	-0.48	-0.45
Co-60(GH)	17.8 ± 2.0 (± 12 %)	18.73 ± 0.08 (± 0.42 %)	-4.7	-0.89	-0.81
Cs-137(GH)	7.1 ± 0.8 (± 12 %)	7.15 ± 0.14 (± 2.0 %)	-0.2	-0.04	-0.03
Fe-59(GH)	15.4 ± 1.8 (± 12 %)	15.07 ± 0.12 (± 0.8 %)	2.2	0.39	0.38
Mn-54	15.0 ± 1.6 (± 12 %)	14.88 ± 0.12 (± 0.8 %)	1.0	0.17	0.17
Sb-125	2.36 ± 0.28 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	2.8	0.45	0.47
H-3(B1)	1.43 ± 0.12 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	-4.4	-1.09	-0.75
C-14	0.83 ± 0.10 (± 12 %)	0.807 ± 0.014 (± 1.6 %)	2.9	0.47	0.51
Tc-99	1.50 ± 0.24 (± 16 %)	1.633 ± 0.008 (± 0.44 %)	-7.9	-1.08	-1.36
I-129	0.38 ± 0.08 (± 18 %)	0.3909 ± 0.0040 (± 1.0 %)	-4.1	-0.45	-0.70
H-3(B2)	0.346 ± 0.032 (± 10 %)	0.3429 ± 0.0048 (± 1.4 %)	0.9	0.19	0.15
Fe-55	1.55 ± 0.32 (± 20 %)	1.46 ± 0.06 (± 3.6 %)	6.0	0.56	1.03
Sr-90	1.44 ± 0.20 (± 14 %)	1.613 ± 0.008 (± 0.42 %)	-11.0	-1.75	-1.88
Pu-241	0.86 ± 0.18 (± 20 %)	0.799 ± 0.018 (± 2.2 %)	7.1	0.66	1.22
Th-232	3.7 ± 0.8 (± 20 %)	3.76 ± 0.08 (± 2.0 %)	-2.8	-0.30	-0.49
Np-237(AL)	4.5 ± 1.6 (± 36 %)	17.95 ± 0.36 (± 2.0 %)	-75.1	-16.17	-12.90
Pu-239(AL)	18.1 ± 3.2 (± 18 %)	18.18 ± 0.08 (± 0.38 %)	-0.4	-0.05	-0.08
Am-241(AL)	3.6 ± 0.8 (± 22 %)	3.532 ± 0.022 (± 0.6 %)	2.0	0.18	0.35
Cm-244(AL)	11.4 ± 2.4 (± 20 %)	10.97 ± 0.08 (± 0.8 %)	3.4	0.32	0.59



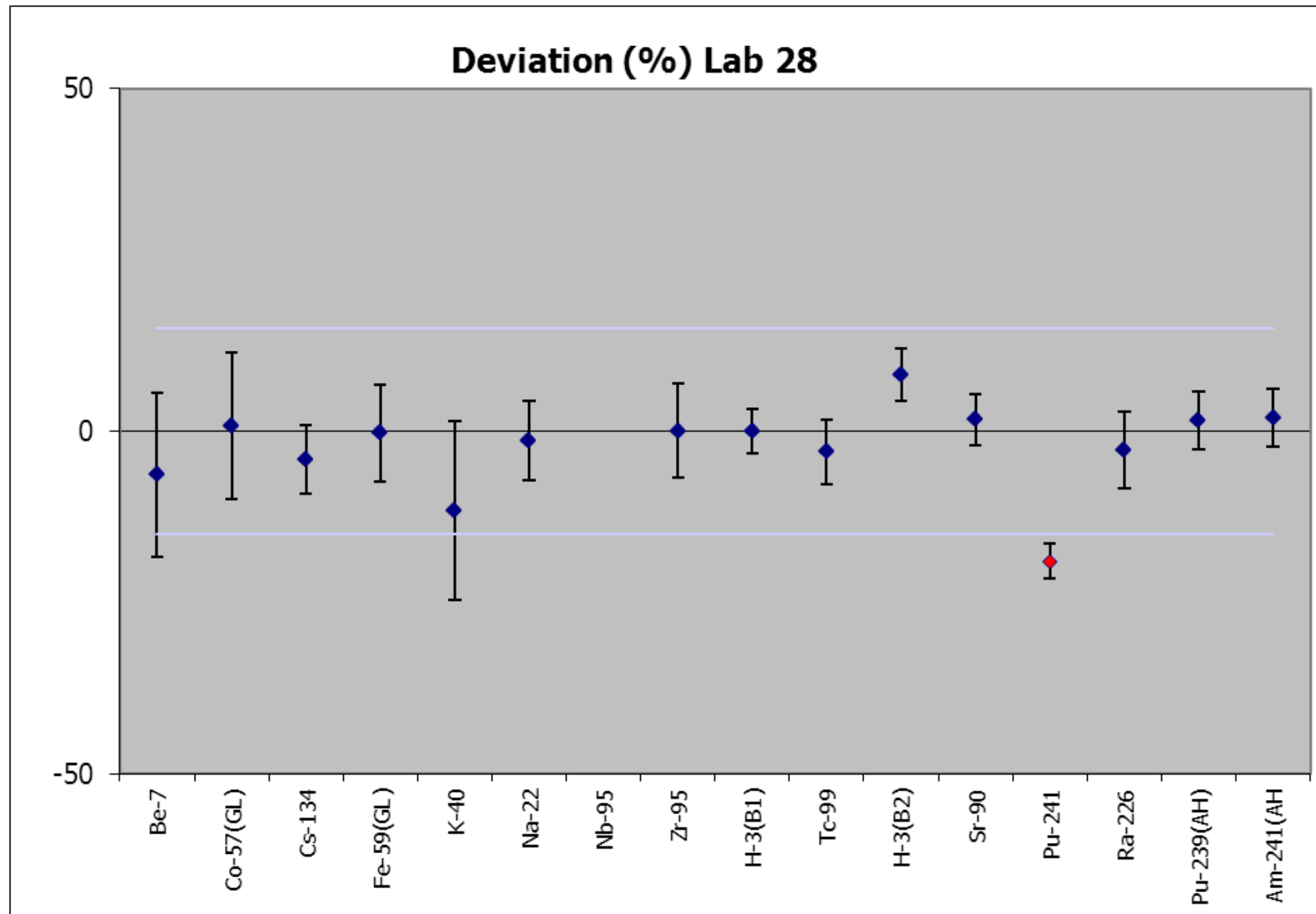
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Nuclide	Lab 26	Assigned Value	Deviation	zeta	z score
Am-241(S)	7.3 ± 0.6 ($\pm 8\%$)	6.8 ± 0.8 ($\pm 10\%$)	8.0	1.28	1.38
Co-60(S)	10.0 ± 1.0 ($\pm 10\%$)	9.1 ± 0.8 ($\pm 8\%$)	9.4	1.35	1.61
Cs-137(S)	11.0 ± 1.0 ($\pm 8\%$)	9.5 ± 0.8 ($\pm 8\%$)	15.9	2.62	2.72
U-234	7.8 ± 1.0 ($\pm 14\%$)	7.8 ± 1.0 ($\pm 12\%$)	-0.2	-0.03	-0.04
U-235	0.304 ± 0.050 ($\pm 16\%$)	0.368 ± 0.030 ($\pm 8\%$)	-17.4	-2.21	-2.98
U-238	7.7 ± 1.0 ($\pm 14\%$)	7.9 ± 1.0 ($\pm 12\%$)	-1.9	-0.22	-0.32
Be-7	17.7 ± 3.0 ($\pm 18\%$)	17.7 ± 0.6 ($\pm 3.4\%$)	-0.2	-0.02	-0.03
Co-57(GL)	2.43 ± 0.26 ($\pm 12\%$)	2.352 ± 0.032 ($\pm 1.4\%$)	3.3	0.60	0.57
Cs-134	5.71 ± 0.44 ($\pm 8\%$)	6.28 ± 0.20 ($\pm 3\%$)	-9.1	-2.38	-1.56
Fe-59(GL)	10.8 ± 1.4 ($\pm 12\%$)	10.85 ± 0.22 ($\pm 2.0\%$)	-0.7	-0.12	-0.13
K-40	16.4 ± 3.0 ($\pm 18\%$)	16.9 ± 1.6 ($\pm 10\%$)	-2.7	-0.27	-0.46
Na-22	9.3 ± 1.0 ($\pm 12\%$)	11.74 ± 0.26 ($\pm 2.2\%$)	-20.5	-4.66	-3.51
Nb-95	13.0 ± 2.4 ($\pm 18\%$)	12.96 ± 0.22 ($\pm 1.8\%$)	0.3	0.03	0.05
Pb-210	13.8 ± 2.2 ($\pm 16\%$)	15.31 ± 0.34 ($\pm 2.2\%$)	-9.9	-1.36	-1.70
Zr-95	5.3 ± 0.6 ($\pm 12\%$)	5.88 ± 0.10 ($\pm 1.6\%$)	-9.8	-1.85	-1.69
Ra-226	4.32 ± 0.36 ($\pm 8\%$)	3.81 ± 0.10 ($\pm 2.6\%$)	13.3	2.71	2.28
Am-241(AH)	3.85 ± 0.14 ($\pm 3.4\%$)	3.786 ± 0.016 ($\pm 0.42\%$)	1.7	1.00	0.30



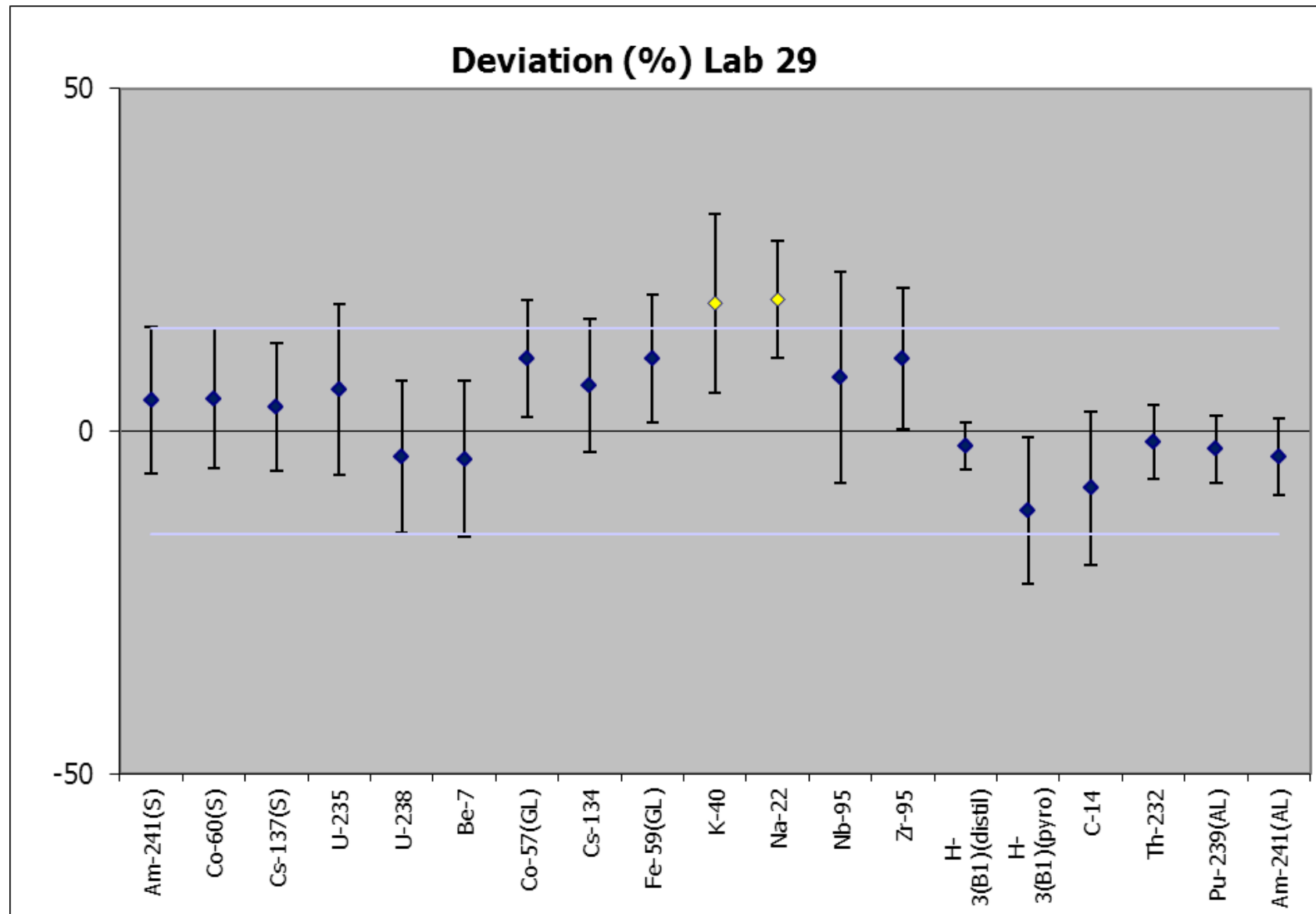
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Nuclide	Lab 27	Assigned Value	Deviation	zeta	z score
Co-58	18.5 ± 3.0 (± 16 %)	18.54 ± 0.28 (± 1.6 %)	-0.2	-0.03	-0.04
Co-60(GH)	19 ± 8 (± 40 %)	18.73 ± 0.08 (± 0.42 %)	-0.7	-0.03	-0.12
Cs-137(GH)	7.4 ± 3.0 (± 40 %)	7.15 ± 0.14 (± 2.0 %)	3.4	0.16	0.59
Fe-59(GH)	16.6 ± 2.6 (± 16 %)	15.07 ± 0.12 (± 0.8 %)	10.1	1.17	1.74
Mn-54	14 ± 6 (± 42 %)	14.88 ± 0.12 (± 0.8 %)	-2.5	-0.13	-0.43
Sb-125	2.2 ± 1.0 (± 46 %)	2.297 ± 0.022 (± 1.0 %)	-4.2	-0.19	-0.72



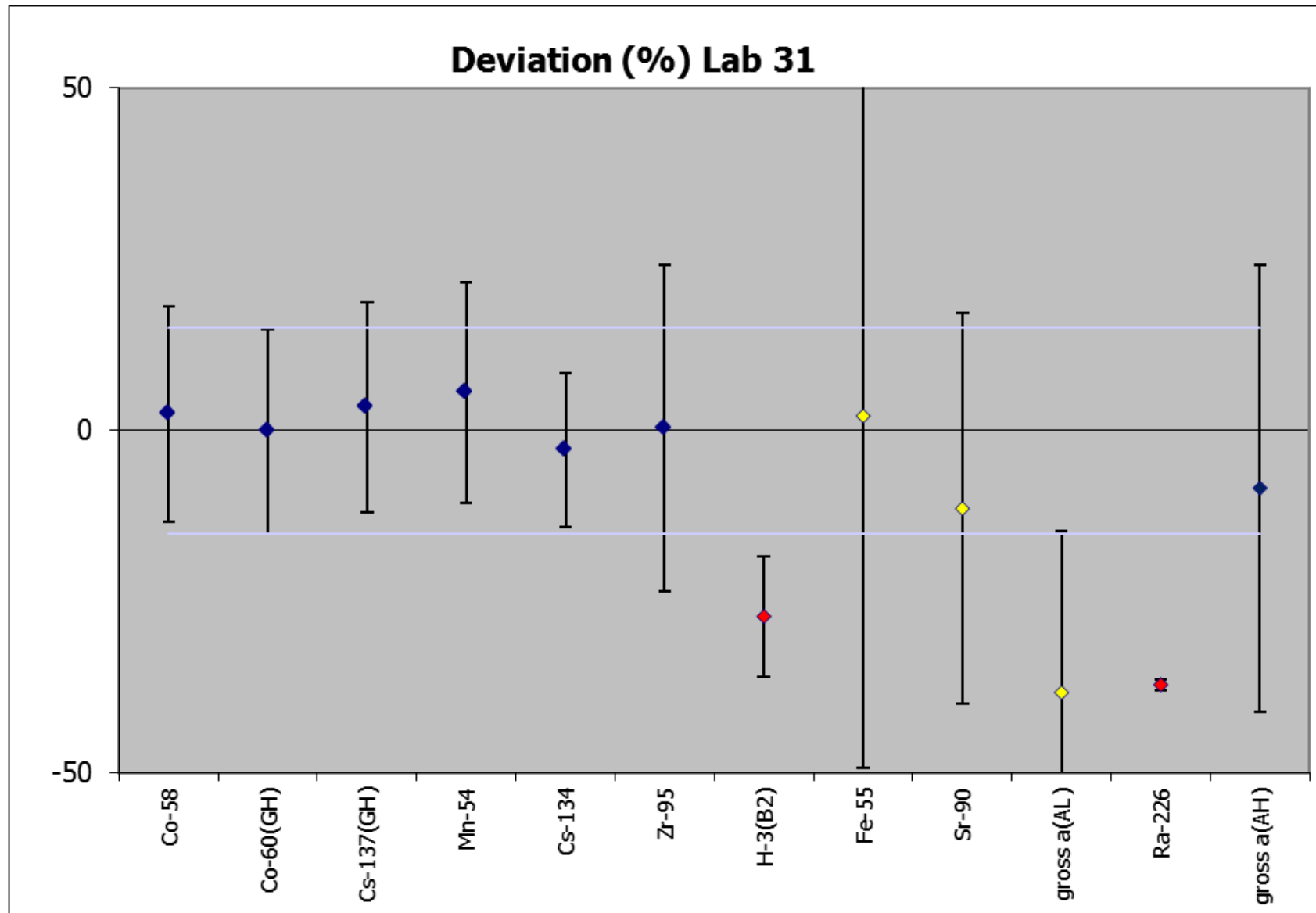
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Nuclide	Lab 28	Assigned Value	Deviation	zeta	z score
Be-7	16.6 ± 4.2 (± 26 %)	17.7 ± 0.6 (± 3.4 %)	-6.4	-0.53	-1.09
Co-57(GL)	2.37 ± 0.50 (± 22 %)	2.352 ± 0.032 (± 1.4 %)	0.8	0.07	0.13
Cs-134	6.0 ± 0.6 (± 10 %)	6.28 ± 0.20 (± 3 %)	-4.1	-0.83	-0.71
Fe-59(GL)	10.8 ± 1.6 (± 14 %)	10.85 ± 0.22 (± 2.0 %)	-0.3	-0.04	-0.05
K-40	14.9 ± 4.2 (± 28 %)	16.9 ± 1.6 (± 10 %)	-11.6	-0.87	-1.99
Na-22	11.6 ± 1.4 (± 12 %)	11.74 ± 0.26 (± 2.2 %)	-1.4	-0.24	-0.24
Nb-95	21.4 ± 2.4 (± 12 %)	12.96 ± 0.22 (± 1.8 %)	65.1	7.00	11.18
Zr-95	5.9 ± 0.8 (± 14 %)	5.88 ± 0.10 (± 1.6 %)	0.0	0.00	0.00
H-3(B1)	1.49 ± 0.10 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	0.0	0.01	0.00
Tc-99	1.58 ± 0.16 (± 10 %)	1.633 ± 0.008 (± 0.44 %)	-3.0	-0.64	-0.52
H-3(B2)	0.371 ± 0.026 (± 8 %)	0.3429 ± 0.0048 (± 1.4 %)	8.2	2.12	1.41
Sr-90	1.64 ± 0.12 (± 8 %)	1.613 ± 0.008 (± 0.42 %)	1.7	0.47	0.30
Pu-241	0.647 ± 0.038 (± 6 %)	0.799 ± 0.018 (± 2.2 %)	-19.0	-7.26	-3.27
Ra-226	3.71 ± 0.42 (± 12 %)	3.81 ± 0.10 (± 2.6 %)	-2.7	-0.48	-0.47
Pu-239(AH)	6.2 ± 0.6 (± 8 %)	6.138 ± 0.026 (± 0.42 %)	1.5	0.35	0.26
Am-241(AH)	3.86 ± 0.32 (± 8 %)	3.786 ± 0.016 (± 0.42 %)	1.9	0.46	0.33



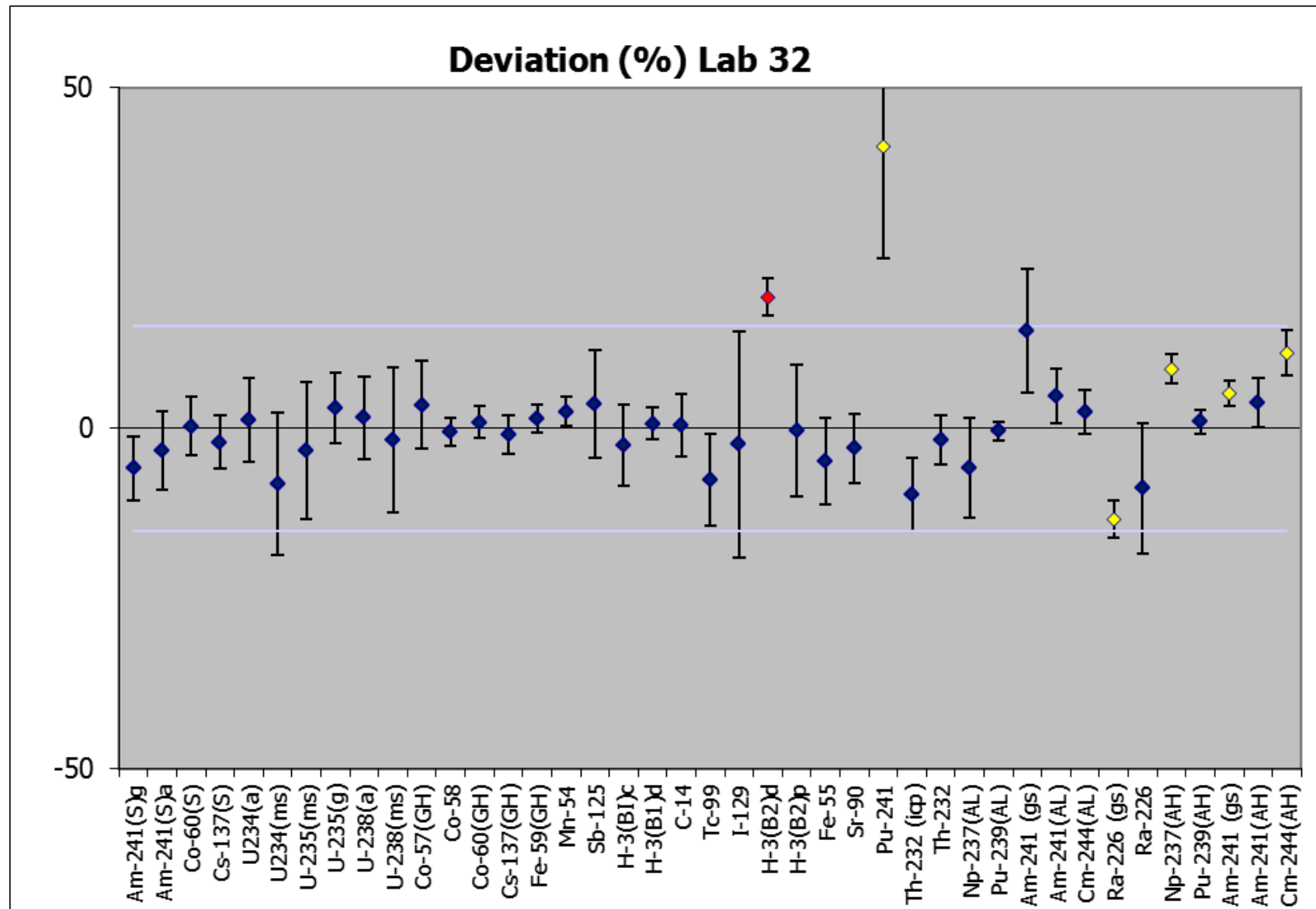
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Nuclide	Lab 29	Assigned Value	Deviation	zeta	z score
Am-241(S)	7.1 ± 1.2 (± 18 %)	6.8 ± 0.8 (± 10 %)	4.5	0.45	0.77
Co-60(S)	9.6 ± 1.8 (± 18 %)	9.1 ± 0.8 (± 8 %)	5.1	0.50	0.87
Cs-137(S)	9.8 ± 1.6 (± 16 %)	9.5 ± 0.8 (± 8 %)	3.5	0.38	0.60
U-235	0.39 ± 0.08 (± 20 %)	0.368 ± 0.030 (± 8 %)	6.0	0.52	1.03
U-238	7.5 ± 1.6 (± 22 %)	7.9 ± 1.0 (± 12 %)	-4.8	-0.42	-0.82
Be-7	17.0 ± 4.0 (± 24 %)	17.7 ± 0.6 (± 3.4 %)	-4.1	-0.36	-0.71
Co-57(GL)	2.60 ± 0.40 (± 16 %)	2.352 ± 0.032 (± 1.4 %)	10.5	1.24	1.81
Cs-134	6.7 ± 1.2 (± 18 %)	6.28 ± 0.20 (± 3 %)	6.7	0.69	1.15
Fe-59(GL)	12.0 ± 2.0 (± 16 %)	10.85 ± 0.22 (± 2.0 %)	10.6	1.14	1.82
K-40	20.0 ± 4.0 (± 20 %)	16.9 ± 1.6 (± 10 %)	18.7	1.47	3.21
Na-22	14.0 ± 2.0 (± 14 %)	11.74 ± 0.26 (± 2.2 %)	19.2	2.24	3.30
Nb-95	14.0 ± 4.0 (± 28 %)	12.96 ± 0.22 (± 1.8 %)	8.0	0.52	1.38
Zr-95	6.5 ± 1.2 (± 18 %)	5.88 ± 0.10 (± 1.6 %)	10.6	1.03	1.81
H-3(B1)(distil)	1.46 ± 0.10 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	-2.2	-0.64	-0.37
H-3(B1)(pyro)	1.32 ± 0.32 (± 24 %)	1.493 ± 0.020 (± 1.4 %)	-11.6	-1.08	-1.99
C-14	0.74 ± 0.18 (± 24 %)	0.807 ± 0.014 (± 1.6 %)	-8.3	-0.74	-1.43
Th-232	3.70 ± 0.40 (± 12 %)	3.76 ± 0.08 (± 2.0 %)	-1.7	-0.31	-0.28
Pu-239(AL)	17.7 ± 1.8 (± 10 %)	18.18 ± 0.08 (± 0.38 %)	-2.6	-0.53	-0.45
Am-241(AL)	3.40 ± 0.40 (± 12 %)	3.532 ± 0.022 (± 0.6 %)	-3.7	-0.66	-0.64



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Nuclide	Lab 31	Assigned Value	Deviation	zeta	z score
Co-58	19 ± 6 (± 30 %)	18.54 ± 0.28 (± 1.6 %)	2.5	0.16	0.42
Co-60(GH)	19 ± 6 (± 30 %)	18.73 ± 0.08 (± 0.42 %)	-0.1	-0.01	-0.02
Cs-137(GH)	7.4 ± 2.2 (± 30 %)	7.15 ± 0.14 (± 2.0 %)	3.4	0.22	0.59
Mn-54	15.7 ± 4.8 (± 30 %)	14.88 ± 0.12 (± 0.8 %)	5.5	0.34	0.95
Cs-134	6.1 ± 1.4 (± 22 %)	6.28 ± 0.20 (± 3 %)	-2.9	-0.26	-0.49
Zr-95	5.9 ± 2.8 (± 48 %)	5.88 ± 0.10 (± 1.6 %)	0.4	0.02	0.06
H-3(B2)	0.25 ± 0.06 (± 24 %)	0.3429 ± 0.0048 (± 1.4 %)	-27.1	-3.09	-4.65
Fe-55	1.5 ± 1.6 (± 100 %)	1.46 ± 0.06 (± 3.6 %)	2.2	0.04	0.37
Sr-90	1.4 ± 1.0 (± 80 %)	1.613 ± 0.008 (± 0.42 %)	-11.3	-0.40	-1.95
gross α (AL)	40 ± 30 (± 80 %)	65 ± 10 (± 16 %)	-38.2	-1.57	-6.56
Ra-226	2.4	3.81 ± 0.10 (± 2.6 %)	-37.1	-28.51	-6.37
gross α (AH)	40 ± 26 (± 80 %)	44 ± 12 (± 28 %)	-8.4	-0.25	-1.44

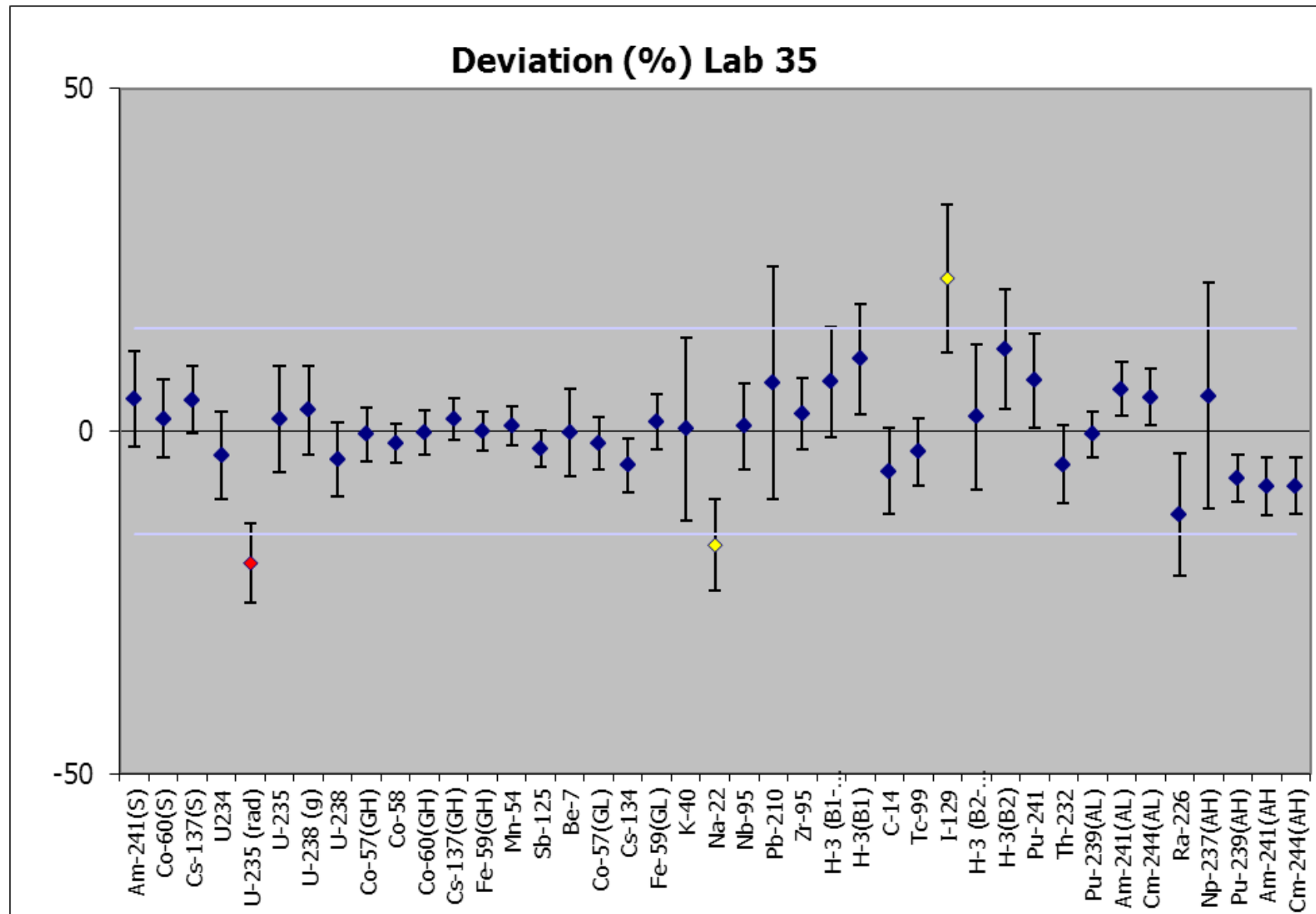


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Nuclide	Lab 32	Assigned Value	Deviation	zeta	z score
Am-241(S)g	6.40 ± 0.18 (± 2.8 %)	6.8 ± 0.8 (± 10 %)	-5.8	-1.20	-1.00
Am-241(S)a	6.58 ± 0.48 (± 8 %)	6.8 ± 0.8 (± 10 %)	-3.2	-0.54	-0.54
Co-60(S)	9.17 ± 0.30 (± 3.2 %)	9.1 ± 0.8 (± 8 %)	0.4	0.09	0.07
Cs-137(S)	9.28 ± 0.30 (± 3.2 %)	9.5 ± 0.8 (± 8 %)	-2.0	-0.50	-0.34
U-234(a)	7.89 ± 0.42 (± 6 %)	7.8 ± 1.0 (± 12 %)	1.3	0.21	0.22
U-234(ms)	7.2 ± 1.4 (± 20 %)	7.8 ± 1.0 (± 12 %)	-8.1	-0.76	-1.39
U-235(ms)	0.36 ± 0.08 (± 20 %)	0.368 ± 0.030 (± 8 %)	-3.2	-0.32	-0.56
U-235(g)	0.379 ± 0.024 (± 8 %)	0.368 ± 0.030 (± 8 %)	3.0	0.58	0.52
U-238(a)	8.00 ± 0.42 (± 6 %)	7.9 ± 1.0 (± 12 %)	1.6	0.26	0.27
U-238(ms)	7.7 ± 1.4 (± 18 %)	7.9 ± 1.0 (± 12 %)	-1.7	-0.16	-0.30
Co-57(GH)	0.84 ± 0.10 (± 12 %)	0.814 ± 0.022 (± 2.8 %)	3.5	0.54	0.60
Co-58	18.4 ± 0.8 (± 4.0 %)	18.54 ± 0.28 (± 1.6 %)	-0.5	-0.24	-0.09
Co-60(GH)	18.9 ± 1.0 (± 4.6 %)	18.73 ± 0.08 (± 0.42 %)	0.9	0.40	0.16
Cs-137(GH)	7.09 ± 0.38 (± 6 %)	7.15 ± 0.14 (± 2.0 %)	-0.9	-0.32	-0.15
Fe-59(GH)	15.3 ± 0.6 (± 4.0 %)	15.07 ± 0.12 (± 0.8 %)	1.5	0.74	0.26
Mn-54	15.2 ± 0.6 (± 4.0 %)	14.88 ± 0.12 (± 0.8 %)	2.5	1.19	0.43
Sb-125	2.38 ± 0.36 (± 16 %)	2.297 ± 0.022 (± 1.0 %)	3.6	0.46	0.62
H-3(BI)c	1.46 ± 0.18 (± 12 %)	1.493 ± 0.020 (± 1.4 %)	-2.4	-0.40	-0.41
H-3(B1)d	1.50 ± 0.08 (± 4.2 %)	1.493 ± 0.020 (± 1.4 %)	0.8	0.34	0.13
C-14	0.81 ± 0.08 (± 10 %)	0.807 ± 0.014 (± 1.6 %)	0.5	0.10	0.08
Tc-99	1.51 ± 0.22 (± 14 %)	1.633 ± 0.008 (± 0.44 %)	-7.5	-1.11	-1.29
I-129	0.38 ± 0.14 (± 34 %)	0.3909 ± 0.0040 (± 1.0 %)	-2.3	-0.14	-0.39
H-3(B2)d	0.409 ± 0.018 (± 4.4 %)	0.3429 ± 0.0048 (± 1.4 %)	19.3	7.24	3.31
H-3(B2)p	0.34 ± 0.08 (± 20 %)	0.3429 ± 0.0048 (± 1.4 %)	-0.3	-0.03	-0.05
Fe-55	1.39 ± 0.18 (± 14 %)	1.46 ± 0.06 (± 3.6 %)	-4.8	-0.76	-0.83
Sr-90	1.57 ± 0.16 (± 10 %)	1.613 ± 0.008 (± 0.42 %)	-2.8	-0.56	-0.49
Pu-241	1.13 ± 0.26 (± 24 %)	0.799 ± 0.018 (± 2.2 %)	41.4	2.54	7.11
Th-232 (MS)	3.40 ± 0.40 (± 12 %)	3.76 ± 0.08 (± 2.0 %)	-9.6	-1.78	-1.65
Th-232	3.70 ± 0.26 (± 8 %)	3.76 ± 0.08 (± 2.0 %)	-1.7	-0.46	-0.28
Np-237(AL)	16.9 ± 2.6 (± 16 %)	17.95 ± 0.36 (± 2.0 %)	-5.8	-0.80	-1.00
Pu-239(AL)	18.12 ± 0.48 (± 2.6 %)	18.18 ± 0.08 (± 0.38 %)	-0.3	-0.25	-0.06
Am-241 (gs)	4.0 ± 0.8 (± 16 %)	3.532 ± 0.022 (± 0.6 %)	14.4	1.59	2.47

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Nuclide	Lab 32	Assigned Value	Deviation	zeta	z score
Am-241(AL)	3.70 ± 0.28 (± 8 %)	3.532 ± 0.022 (± 0.6 %)	4.8	1.20	0.82
Cm-244(AL)	11.2 ± 0.8 (± 6 %)	10.97 ± 0.08 (± 0.8 %)	2.4	0.73	0.40
Ra-226 (gs)	3.31 ± 0.20 (± 6 %)	3.81 ± 0.10 (± 2.6 %)	-13.3	-4.74	-2.29
Ra-226	3.5 ± 0.8 (± 20 %)	3.81 ± 0.10 (± 2.6 %)	-8.8	-0.92	-1.50
Np-237(AH)	11.89 ± 0.40 (± 3.4 %)	10.94 ± 0.22 (± 2.0 %)	8.7	4.19	1.50
Pu-239(AH)	6.20 ± 0.22 (± 3.6 %)	6.138 ± 0.026 (± 0.42 %)	1.0	0.56	0.17
Am-241 (gs)	3.98 ± 0.14 (± 3.6 %)	3.786 ± 0.016 (± 0.42 %)	5.2	2.70	0.89
Am-241(AH)	3.93 ± 0.28 (± 8 %)	3.786 ± 0.016 (± 0.42 %)	3.8	1.03	0.65
Cm-244(AH)	16.2 ± 1.0 (± 6 %)	14.63 ± 0.10 (± 0.6 %)	11.1	3.36	1.90

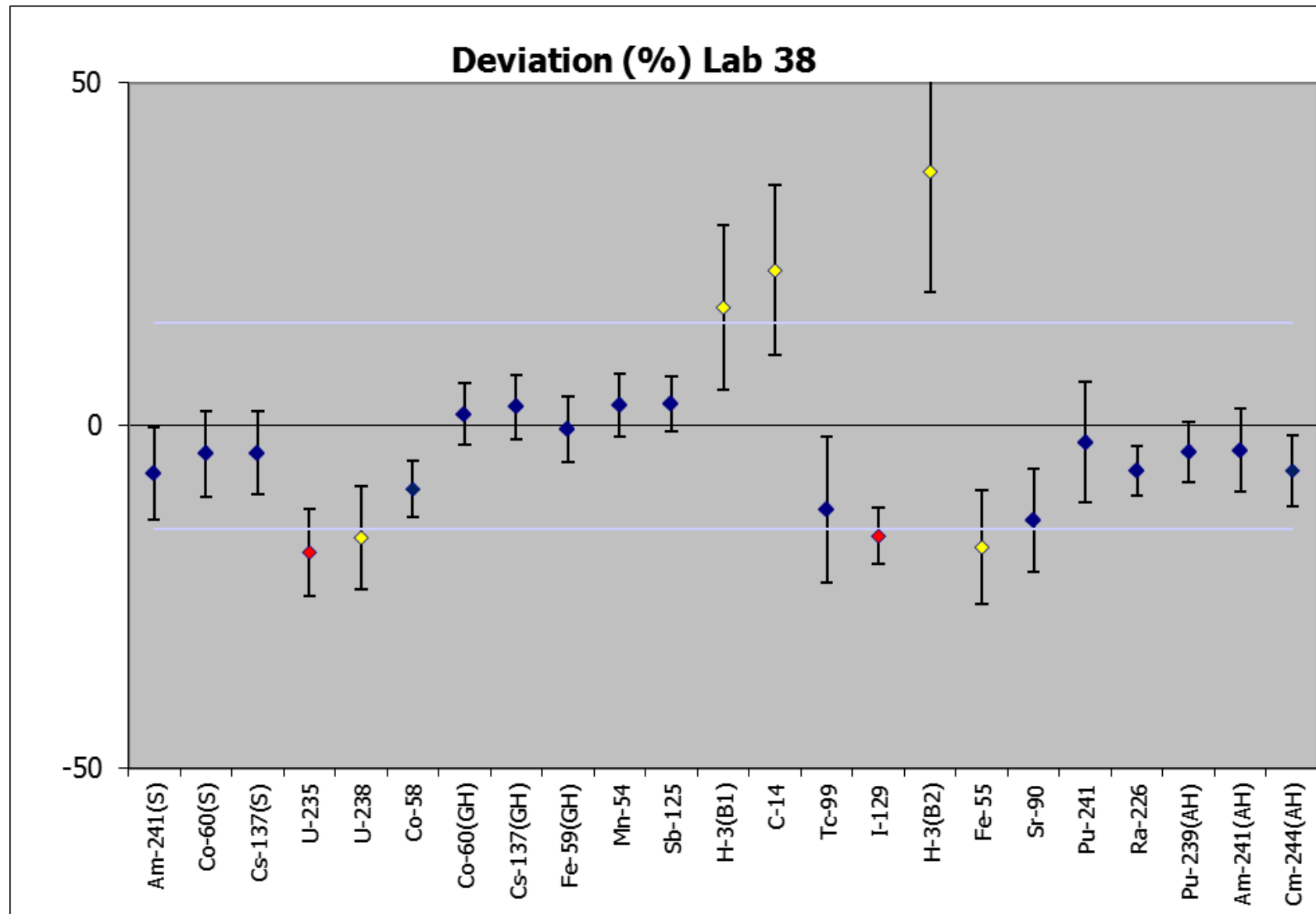


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Nuclide	Lab 35	Assigned Value	Deviation	zeta	z score
Am-241(S)	7.11 ± 0.46 (± 8 %)	6.8 ± 0.8 (± 10 %)	4.6	0.80	0.80
Co-60(S)	9.3 ± 0.8 (± 8 %)	9.1 ± 0.8 (± 8 %)	2.1	0.38	0.37
Cs-137(S)	9.9 ± 0.6 (± 6 %)	9.5 ± 0.8 (± 8 %)	4.6	0.98	0.78
U-234	7.5 ± 0.6 (± 8 %)	7.8 ± 1.0 (± 12 %)	-3.8	-0.60	-0.66
U-235 (rad)	0.297 ± 0.026 (± 10 %)	0.368 ± 0.030 (± 8 %)	-19.3	-3.62	-3.31
U-235	0.374 ± 0.038 (± 10 %)	0.368 ± 0.030 (± 8 %)	1.6	0.25	0.28
U-238 (g)	8.0 ± 0.8 (± 10 %)	7.9 ± 1.0 (± 12 %)	2.0	0.28	0.34
U-238	7.5 ± 0.6 (± 8 %)	7.9 ± 1.0 (± 12 %)	-5.2	-0.82	-0.89
Co-57(GH)	0.81 ± 0.06 (± 8 %)	0.814 ± 0.022 (± 2.8 %)	-0.4	-0.11	-0.08
Co-58	18.2 ± 1.0 (± 6 %)	18.54 ± 0.28 (± 1.6 %)	-1.7	-0.61	-0.30
Co-60(GH)	18.7 ± 1.2 (± 8 %)	18.73 ± 0.08 (± 0.42 %)	-0.2	-0.08	-0.04
Cs-137(GH)	7.28 ± 0.42 (± 6 %)	7.15 ± 0.14 (± 2.0 %)	1.8	0.57	0.30
Fe-59(GH)	15.1 ± 1.0 (± 6 %)	15.07 ± 0.12 (± 0.8 %)	0.0	0.01	0.01
Mn-54	15.0 ± 0.8 (± 6 %)	14.88 ± 0.12 (± 0.8 %)	0.7	0.24	0.12
Sb-125	2.24 ± 0.12 (± 6 %)	2.297 ± 0.022 (± 1.0 %)	-2.5	-0.93	-0.42
Be-7	17.7 ± 2.2 (± 12 %)	17.7 ± 0.6 (± 3.4 %)	-0.2	-0.02	-0.03
Co-57(GL)	2.31 ± 0.18 (± 8 %)	2.352 ± 0.032 (± 1.4 %)	-1.8	-0.46	-0.31
Cs-134	5.97 ± 0.46 (± 8 %)	6.28 ± 0.20 (± 3 %)	-4.9	-1.25	-0.85
Fe-59(GL)	11.0 ± 1.0 (± 8 %)	10.85 ± 0.22 (± 2.0 %)	1.4	0.34	0.24
K-40	16.9 ± 4.2 (± 24 %)	16.9 ± 1.6 (± 10 %)	0.3	0.02	0.05
Na-22	9.8 ± 1.6 (± 16 %)	11.74 ± 0.26 (± 2.2 %)	-16.6	-2.47	-2.85
Nb-95	13.1 ± 1.6 (± 12 %)	12.96 ± 0.22 (± 1.8 %)	0.8	0.13	0.15
Pb-210	16 ± 6 (± 32 %)	15.31 ± 0.34 (± 2.2 %)	7.1	0.42	1.22
Zr-95	6.0 ± 0.6 (± 10 %)	5.88 ± 0.10 (± 1.6 %)	2.6	0.50	0.44
H-3(B1-com)	1.60 ± 0.24 (± 16 %)	1.493 ± 0.020 (± 1.4 %)	7.2	0.89	1.24
H-3(B1)	1.65 ± 0.24 (± 14 %)	1.493 ± 0.020 (± 1.4 %)	10.5	1.31	1.81
C-14	0.76 ± 0.10 (± 14 %)	0.807 ± 0.014 (± 1.6 %)	-5.8	-0.94	-1.00
Tc-99	1.58 ± 0.16 (± 10 %)	1.633 ± 0.008 (± 0.44 %)	-3.0	-0.62	-0.52
I-129	0.48 ± 0.08 (± 18 %)	0.3909 ± 0.0040 (± 1.0 %)	22.5	2.09	3.87
H-3(B2-com)	0.35 ± 0.08 (± 20 %)	0.3429 ± 0.0048 (± 1.4 %)	2.1	0.20	0.35
H-3(B2)	0.38 ± 0.06 (± 16 %)	0.3429 ± 0.0048 (± 1.4 %)	12.0	1.36	2.06
Pu-241	0.86 ± 0.12 (± 12 %)	0.799 ± 0.018 (± 2.2 %)	7.4	1.08	1.27
Th-232	3.58 ± 0.42 (± 12 %)	3.76 ± 0.08 (± 2.0 %)	-4.8	-0.85	-0.83

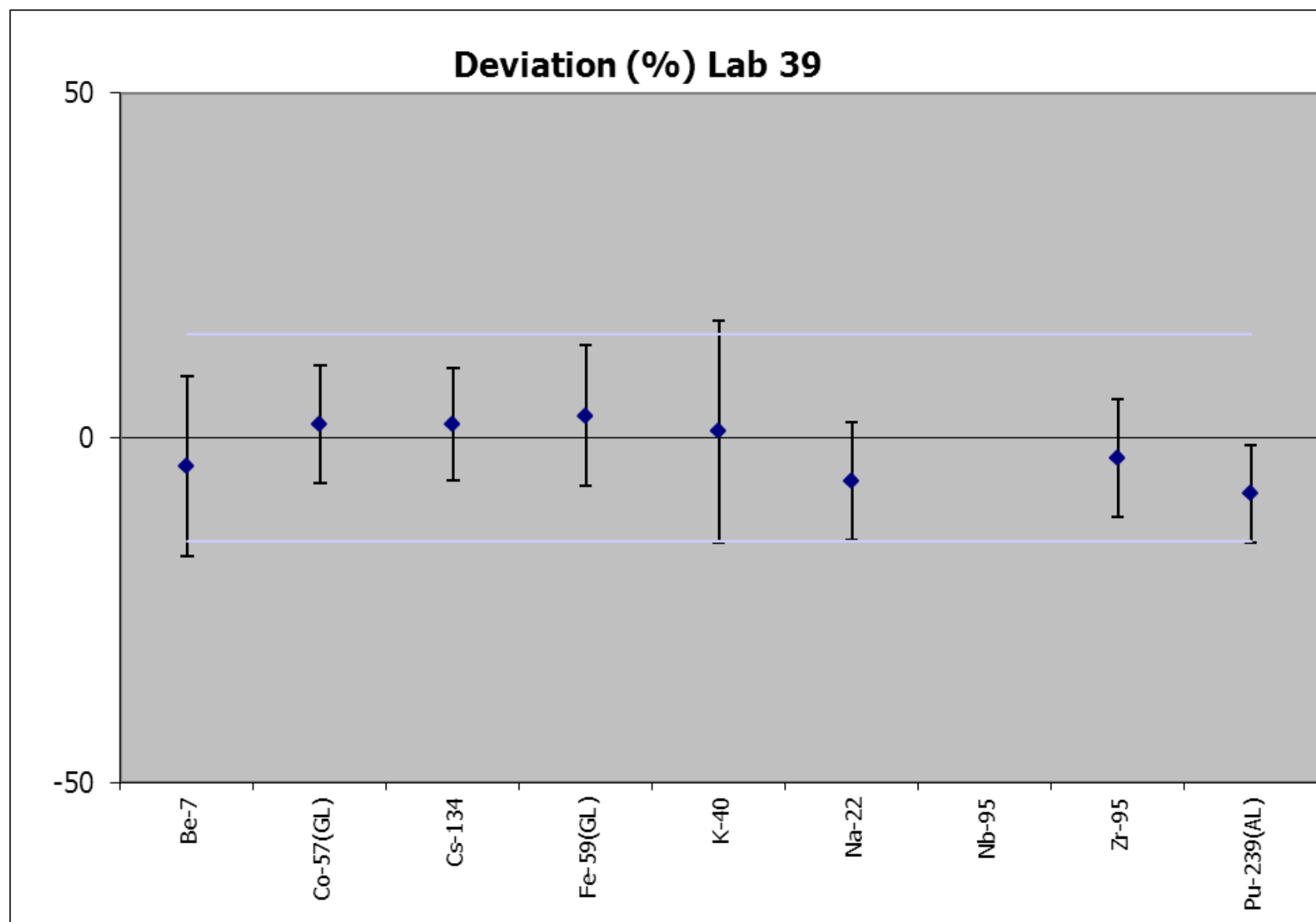
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Nuclide	Lab 35	Assigned Value	Deviation	zeta	z score
Pu-239(AL)	18.1 ± 1.2 ($\pm 8\%$)	18.18 ± 0.08 ($\pm 0.38\%$)	-0.4	-0.13	-0.08
Am-241(AL)	3.75 ± 0.28 ($\pm 8\%$)	3.532 ± 0.022 ($\pm 0.6\%$)	6.2	1.55	1.06
Cm-244(AL)	11.5 ± 1.0 ($\pm 8\%$)	10.97 ± 0.08 ($\pm 0.8\%$)	4.9	1.19	0.84
Ra-226	3.4 ± 0.8 ($\pm 20\%$)	3.81 ± 0.10 ($\pm 2.6\%$)	-12.2	-1.35	-2.09
Np-237(AH)	11.5 ± 3.6 ($\pm 32\%$)	10.94 ± 0.22 ($\pm 2.0\%$)	5.2	0.31	0.89
Pu-239(AH)	5.72 ± 0.42 ($\pm 8\%$)	6.138 ± 0.026 ($\pm 0.42\%$)	-6.8	-1.99	-1.17
Am-241(AH)	3.48 ± 0.32 ($\pm 10\%$)	3.786 ± 0.016 ($\pm 0.42\%$)	-8.1	-1.91	-1.39
Cm-244(AH)	13.5 ± 1.2 ($\pm 10\%$)	14.63 ± 0.10 ($\pm 0.6\%$)	-8.0	-1.91	-1.37



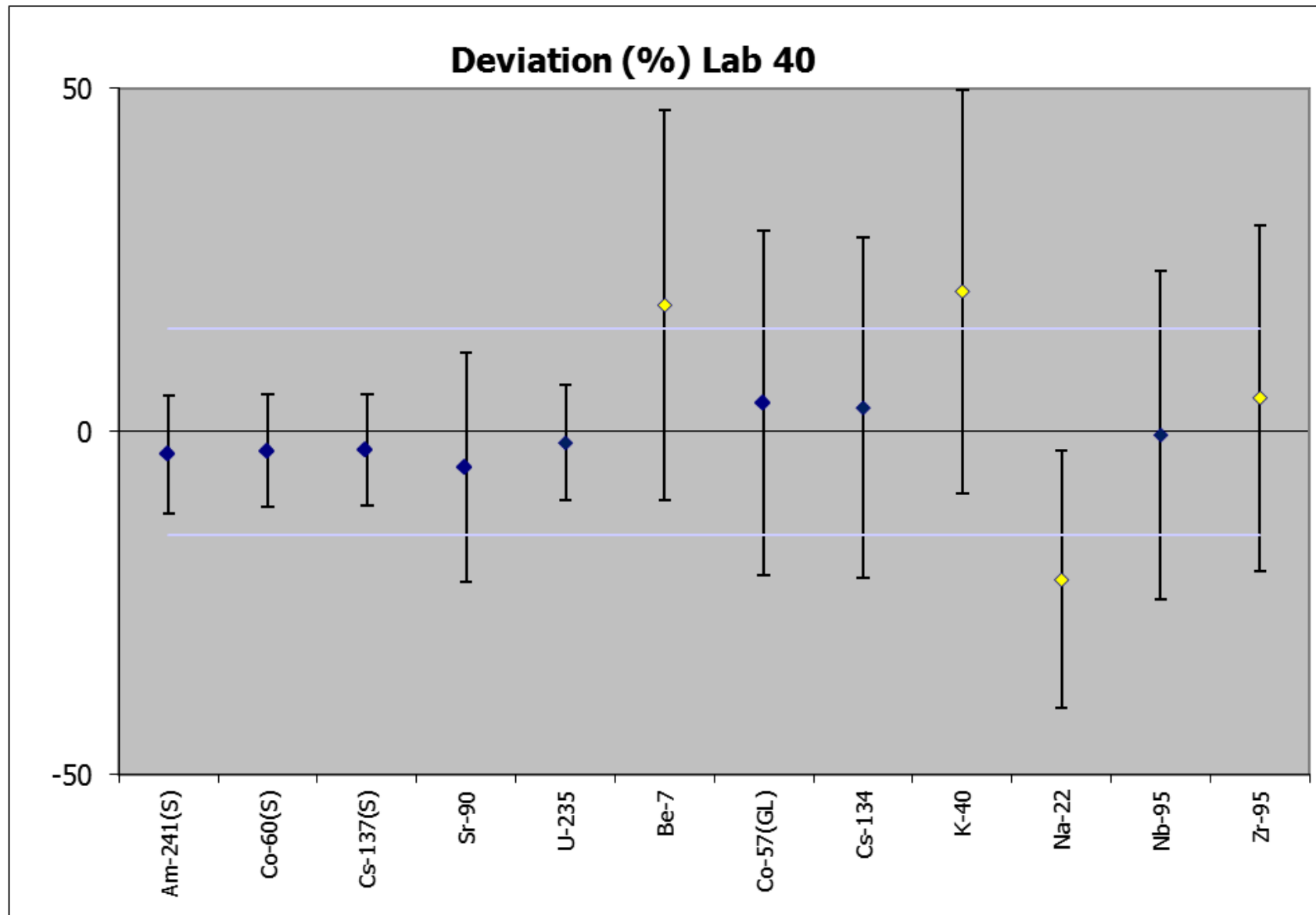
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Nuclide	Lab 38	Assigned Value	Deviation	zeta	z score
Am-241(S)	6.3 ± 0.8 (± 12 %)	6.8 ± 0.8 (± 10 %)	-7.0	-1.01	-1.20
Co-60(S)	8.8 ± 1.0 (± 10 %)	9.1 ± 0.8 (± 8 %)	-4.1	-0.65	-0.71
Cs-137(S)	9.1 ± 1.0 (± 10 %)	9.5 ± 0.8 (± 8 %)	-4.0	-0.65	-0.69
U-235	0.300 ± 0.040 (± 14 %)	0.368 ± 0.030 (± 8 %)	-18.5	-2.74	-3.17
U-238	6.6 ± 1.0 (± 14 %)	7.9 ± 1.0 (± 12 %)	-16.3	-2.01	-2.80
Co-58	16.8 ± 1.6 (± 10 %)	18.54 ± 0.28 (± 1.6 %)	-9.2	-2.27	-1.59
Co-60(GH)	19.0 ± 1.6 (± 10 %)	18.73 ± 0.08 (± 0.42 %)	1.7	0.38	0.29
Cs-137(GH)	7.4 ± 0.8 (± 10 %)	7.15 ± 0.14 (± 2.0 %)	2.7	0.58	0.47
Fe-59(GH)	15.0 ± 1.4 (± 10 %)	15.07 ± 0.12 (± 0.8 %)	-0.6	-0.12	-0.10
Mn-54	15.3 ± 1.4 (± 10 %)	14.88 ± 0.12 (± 0.8 %)	3.0	0.65	0.51
Sb-125	2.37 ± 0.18 (± 8 %)	2.297 ± 0.022 (± 1.0 %)	3.2	0.81	0.55
H-3(B1)	1.75 ± 0.36 (± 20 %)	1.493 ± 0.020 (± 1.4 %)	17.2	1.43	2.96
C-14	0.99 ± 0.20 (± 20 %)	0.807 ± 0.014 (± 1.6 %)	22.6	1.82	3.89
Tc-99	1.43 ± 0.34 (± 24 %)	1.633 ± 0.008 (± 0.44 %)	-12.2	-1.15	-2.10
I-129	0.328 ± 0.032 (± 10 %)	0.3909 ± 0.0040 (± 1.0 %)	-16.1	-3.91	-2.77
H-3(B2)	0.47 ± 0.12 (± 26 %)	0.3429 ± 0.0048 (± 1.4 %)	37.1	2.12	6.36
Fe-55	1.20 ± 0.24 (± 20 %)	1.46 ± 0.06 (± 3.6 %)	-17.7	-2.11	-3.04
Sr-90	1.39 ± 0.24 (± 18 %)	1.613 ± 0.008 (± 0.42 %)	-13.8	-1.86	-2.37
Pu-241	0.78 ± 0.14 (± 18 %)	0.799 ± 0.018 (± 2.2 %)	-2.4	-0.27	-0.41
Ra-226	3.56 ± 0.26 (± 8 %)	3.81 ± 0.10 (± 2.6 %)	-6.7	-1.83	-1.14
Pu-239(AH)	5.9 ± 0.6 (± 10 %)	6.138 ± 0.026 (± 0.42 %)	-3.9	-0.88	-0.67
Am-241(AH)	3.65 ± 0.46 (± 12 %)	3.786 ± 0.016 (± 0.42 %)	-3.6	-0.59	-0.62
Cm-244(AH)	13.7 ± 1.6 (± 12 %)	14.63 ± 0.10 (± 0.6 %)	-6.6	-1.28	-1.13



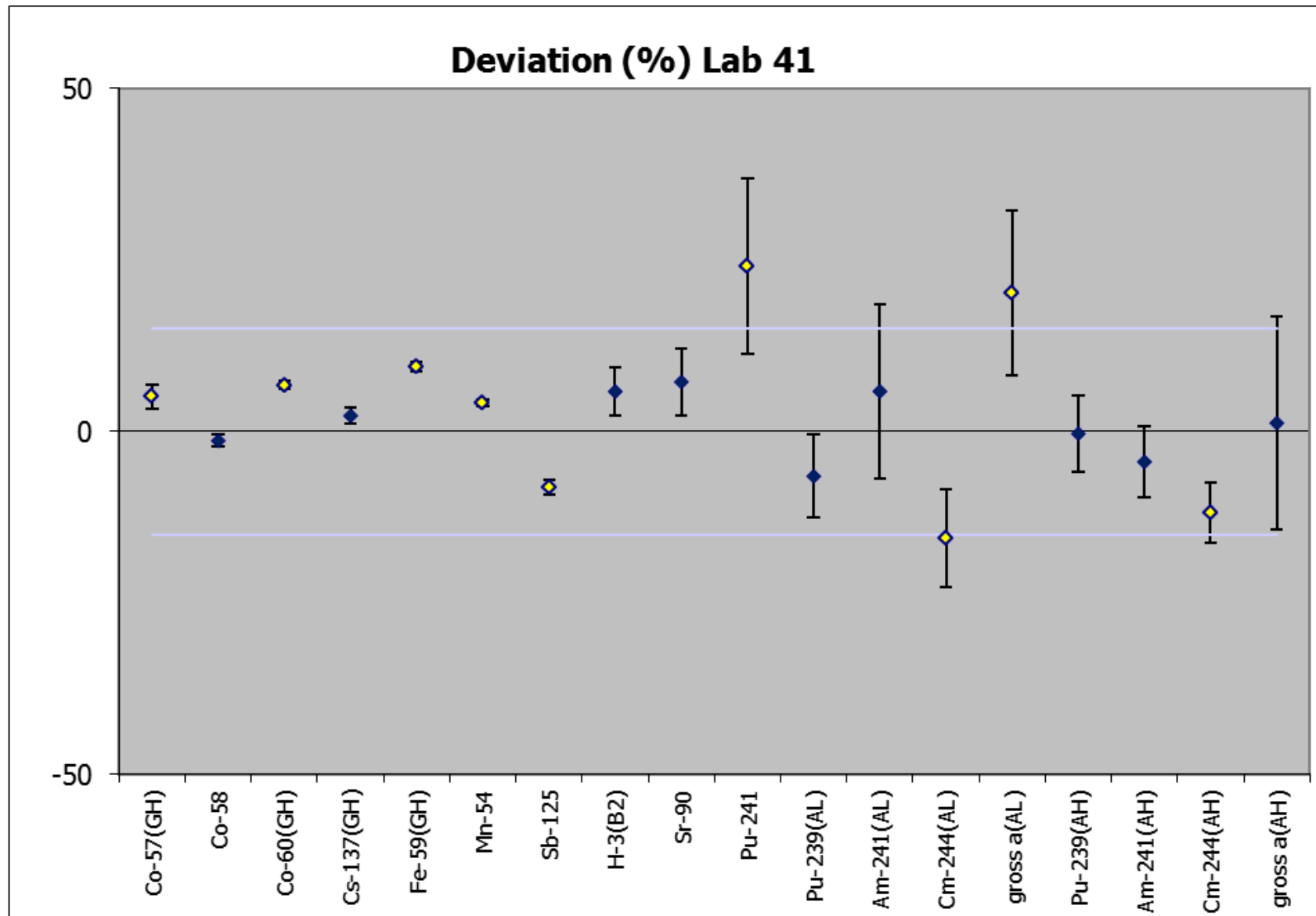
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Nuclide	Lab 39	Assigned Value	Deviation	zeta	z score
Be-7	17.0 ± 4.6 (± 28 %)	17.7 ± 0.6 (± 3.4 %)	-4.1	-0.31	-0.71
Co-57(GL)	2.40 ± 0.40 (± 16 %)	2.352 ± 0.032 (± 1.4 %)	2.0	0.24	0.35
Cs-134	6.4 ± 1.0 (± 16 %)	6.28 ± 0.20 (± 3 %)	1.9	0.24	0.33
Fe-59(GL)	11.2 ± 2.2 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	3.2	0.32	0.55
K-40	17 ± 6 (± 30 %)	16.9 ± 1.6 (± 10 %)	0.9	0.05	0.15
Na-22	11.0 ± 2.0 (± 18 %)	11.74 ± 0.26 (± 2.2 %)	-6.3	-0.74	-1.09
Nb-95	1.20 ± 0.20 (± 16 %)	12.96 ± 0.22 (± 1.8 %)	-90.7	-77.70	-15.58
Zr-95	5.7 ± 1.0 (± 18 %)	5.88 ± 0.10 (± 1.6 %)	-3.0	-0.36	-0.52
Pu-239(AL)	16.7 ± 2.6 (± 16 %)	18.18 ± 0.08 (± 0.38 %)	-8.1	-1.14	-1.40



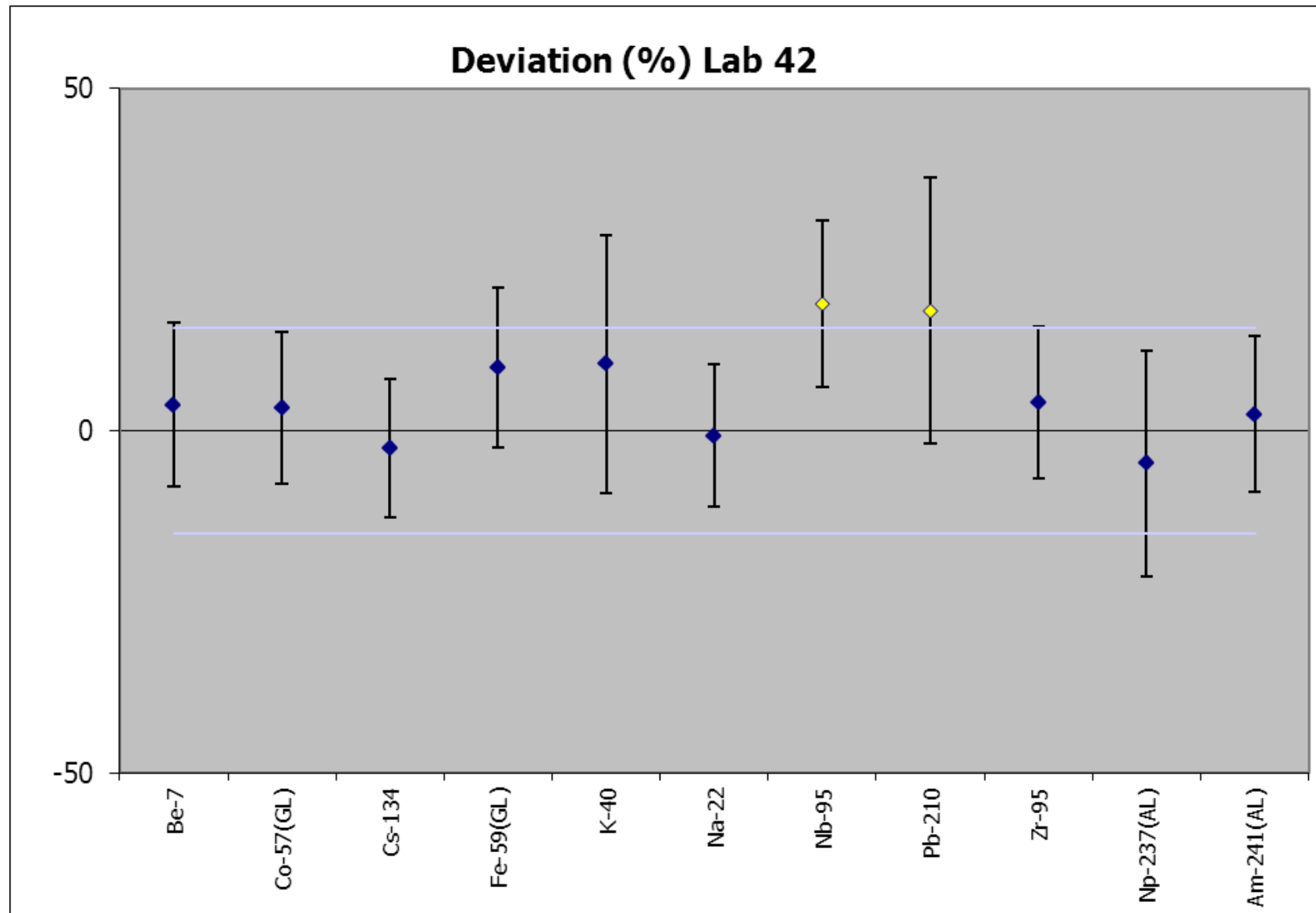
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Nuclide	Lab 40	Assigned Value	Deviation	zeta	z score
Am-241(S)	6.6 ± 1.0 (± 16 %)	6.8 ± 0.8 (± 10 %)	-3.3	-0.38	-0.57
Co-60(S)	8.9 ± 1.4 (± 16 %)	9.1 ± 0.8 (± 8 %)	-2.8	-0.34	-0.48
Cs-137(S)	9.2 ± 1.4 (± 16 %)	9.5 ± 0.8 (± 8 %)	-2.7	-0.34	-0.47
Sr-90	1.5 ± 0.6 (± 36 %)	1.613 ± 0.008 (± 0.42 %)	-5.1	-0.31	-0.88
U-235	0.36 ± 0.06 (± 16 %)	0.368 ± 0.030 (± 8 %)	-1.6	-0.19	-0.28
Be-7	21 ± 10 (± 48 %)	17.7 ± 0.6 (± 3.4 %)	18.5	0.65	3.17
Co-57(GL)	2.4 ± 1.2 (± 48 %)	2.352 ± 0.032 (± 1.4 %)	4.2	0.17	0.72
Cs-134	6.5 ± 3.2 (± 48 %)	6.28 ± 0.20 (± 3 %)	3.5	0.14	0.60
K-40	20 ± 10 (± 48 %)	16.9 ± 1.6 (± 10 %)	20.5	0.70	3.51
Na-22	9.2 ± 4.4 (± 48 %)	11.74 ± 0.26 (± 2.2 %)	-21.6	-1.15	-3.70
Nb-95	13 ± 6 (± 48 %)	12.96 ± 0.22 (± 1.8 %)	-0.5	-0.02	-0.08
Zr-95	6.2 ± 3.0 (± 48 %)	5.88 ± 0.10 (± 1.6 %)	5.0	0.20	0.85



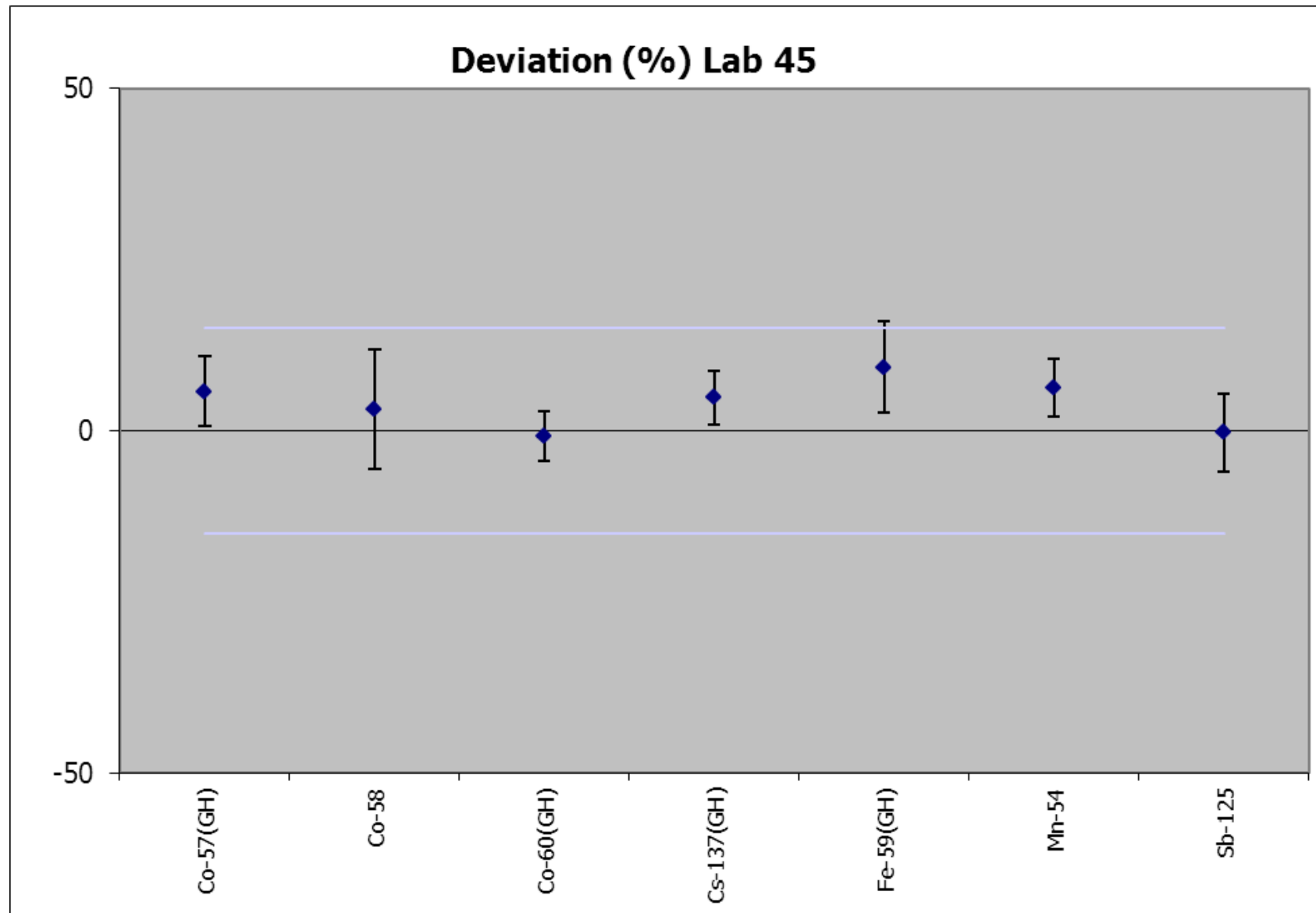
NPL Report IR 27

Nuclide	Lab 41	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.855 ± 0.014 (± 1.8 %)	0.814 ± 0.022 (± 2.8 %)	5.1	3.14	0.87
Co-58	18.30 ± 0.16 (± 1.0 %)	18.54 ± 0.28 (± 1.6 %)	-1.3	-1.49	-0.23
Co-60(GH)	20.00 ± 0.22 (± 1.2 %)	18.73 ± 0.08 (± 0.42 %)	6.8	11.09	1.17
Cs-137(GH)	7.32 ± 0.08 (± 1.0 %)	7.15 ± 0.14 (± 2.0 %)	2.3	2.10	0.40
Fe-59(GH)	16.50 ± 0.18 (± 1.2 %)	15.07 ± 0.12 (± 0.8 %)	9.5	12.99	1.63
Mn-54	15.50 ± 0.14 (± 0.8 %)	14.88 ± 0.12 (± 0.8 %)	4.2	7.40	0.72
Sb-125	2.110 ± 0.046 (± 2.2 %)	2.297 ± 0.022 (± 1.0 %)	-8.1	-7.28	-1.40
H-3(B2)	0.363 ± 0.024 (± 8 %)	0.3429 ± 0.0048 (± 1.4 %)	5.9	1.67	1.01
Sr-90	1.73 ± 0.16 (± 10 %)	1.613 ± 0.008 (± 0.42 %)	7.3	1.47	1.25
Pu-241	0.99 ± 0.20 (± 20 %)	0.799 ± 0.018 (± 2.2 %)	24.1	1.88	4.15
Pu-239(AL)	17.0 ± 2.2 (± 14 %)	18.18 ± 0.08 (± 0.38 %)	-6.5	-1.06	-1.12
Am-241(AL)	3.7 ± 1.0 (± 24 %)	3.532 ± 0.022 (± 0.6 %)	5.9	0.47	1.01
Cm-244(AL)	9.3 ± 1.6 (± 16 %)	10.97 ± 0.08 (± 0.8 %)	-15.5	-2.18	-2.66
gross α (AL)	78 ± 10 (± 14 %)	65 ± 10 (± 16 %)	20.2	1.85	3.46
Pu-239(AH)	6.1 ± 0.8 (± 12 %)	6.138 ± 0.026 (± 0.42 %)	-0.3	-0.05	-0.05
Am-241(AH)	3.62 ± 0.40 (± 12 %)	3.786 ± 0.016 (± 0.42 %)	-4.4	-0.84	-0.75
Cm-244(AH)	12.9 ± 1.4 (± 10 %)	14.63 ± 0.10 (± 0.6 %)	-11.8	-2.71	-2.03
gross α (AH)	44.2 ± 4.6 (± 10 %)	44 ± 12 (± 28 %)	1.3	0.08	0.22



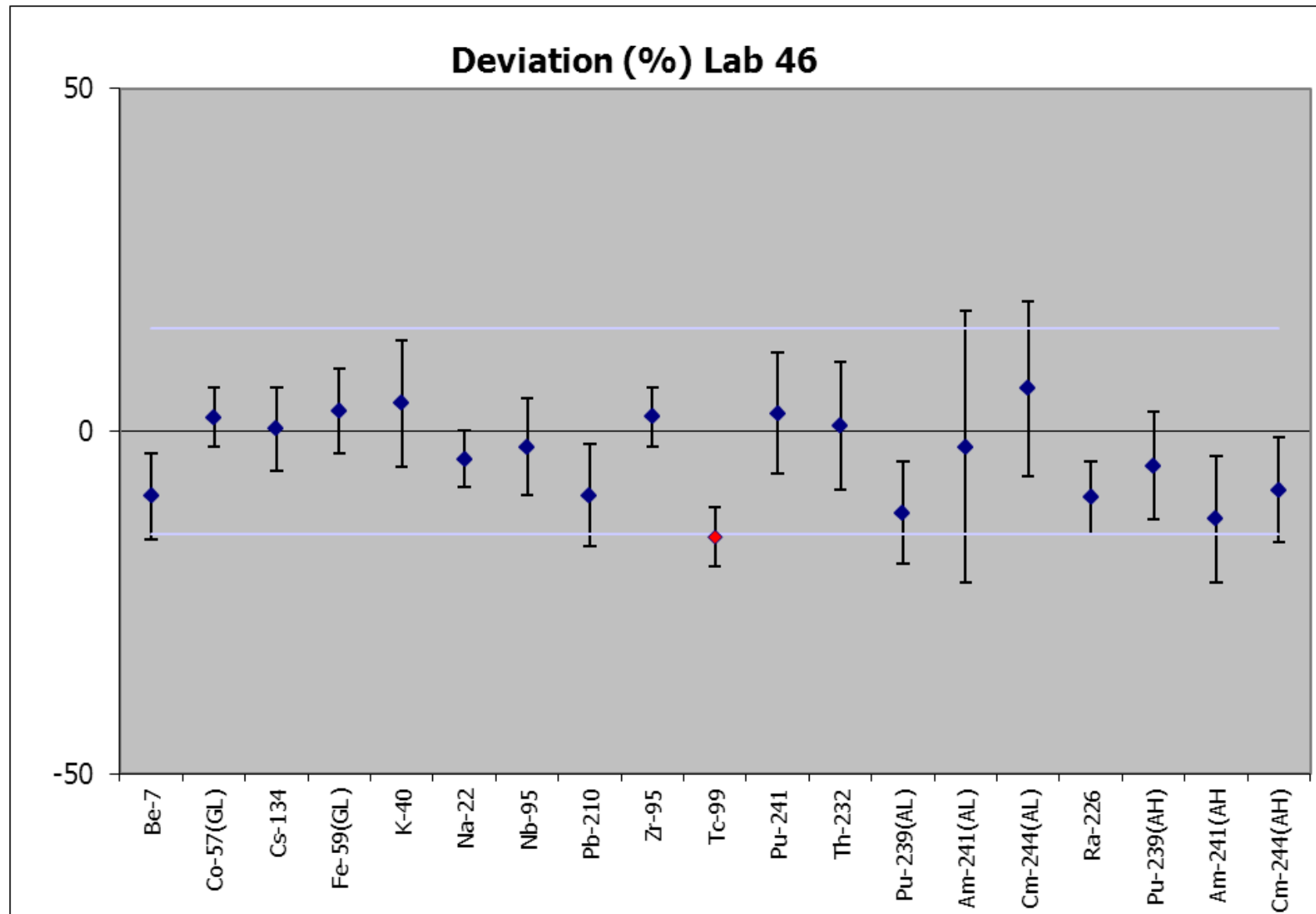
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Nuclide	Lab 42	Assigned Value	Deviation	zeta	z score
Be-7	18.4 ± 4.2 ($\pm 22\%$)	17.7 ± 0.6 ($\pm 3.4\%$)	3.7	0.31	0.64
Co-57(GL)	2.4 ± 0.6 ($\pm 22\%$)	2.352 ± 0.032 ($\pm 1.4\%$)	3.3	0.30	0.57
Cs-134	6.1 ± 1.2 ($\pm 20\%$)	6.28 ± 0.20 ($\pm 3\%$)	-2.6	-0.25	-0.44
Fe-59(GL)	11.9 ± 2.6 ($\pm 22\%$)	10.85 ± 0.22 ($\pm 2.0\%$)	9.3	0.80	1.60
K-40	18 ± 6 ($\pm 32\%$)	16.9 ± 1.6 ($\pm 10\%$)	9.7	0.52	1.67
Na-22	11.7 ± 2.4 ($\pm 20\%$)	11.74 ± 0.26 ($\pm 2.2\%$)	-0.7	-0.07	-0.12
Nb-95	15.4 ± 3.2 ($\pm 20\%$)	12.96 ± 0.22 ($\pm 1.8\%$)	18.7	1.53	3.21
Pb-210	18 ± 6 ($\pm 34\%$)	15.31 ± 0.34 ($\pm 2.2\%$)	17.5	0.90	3.00
Zr-95	6.1 ± 1.4 ($\pm 22\%$)	5.88 ± 0.10 ($\pm 1.6\%$)	4.1	0.37	0.70
Np-237(AL)	17 ± 6 ($\pm 34\%$)	17.95 ± 0.36 ($\pm 2.0\%$)	-4.8	-0.29	-0.82
Am-241(AL)	3.6 ± 0.8 ($\pm 22\%$)	3.532 ± 0.022 ($\pm 0.6\%$)	2.4	0.21	0.42



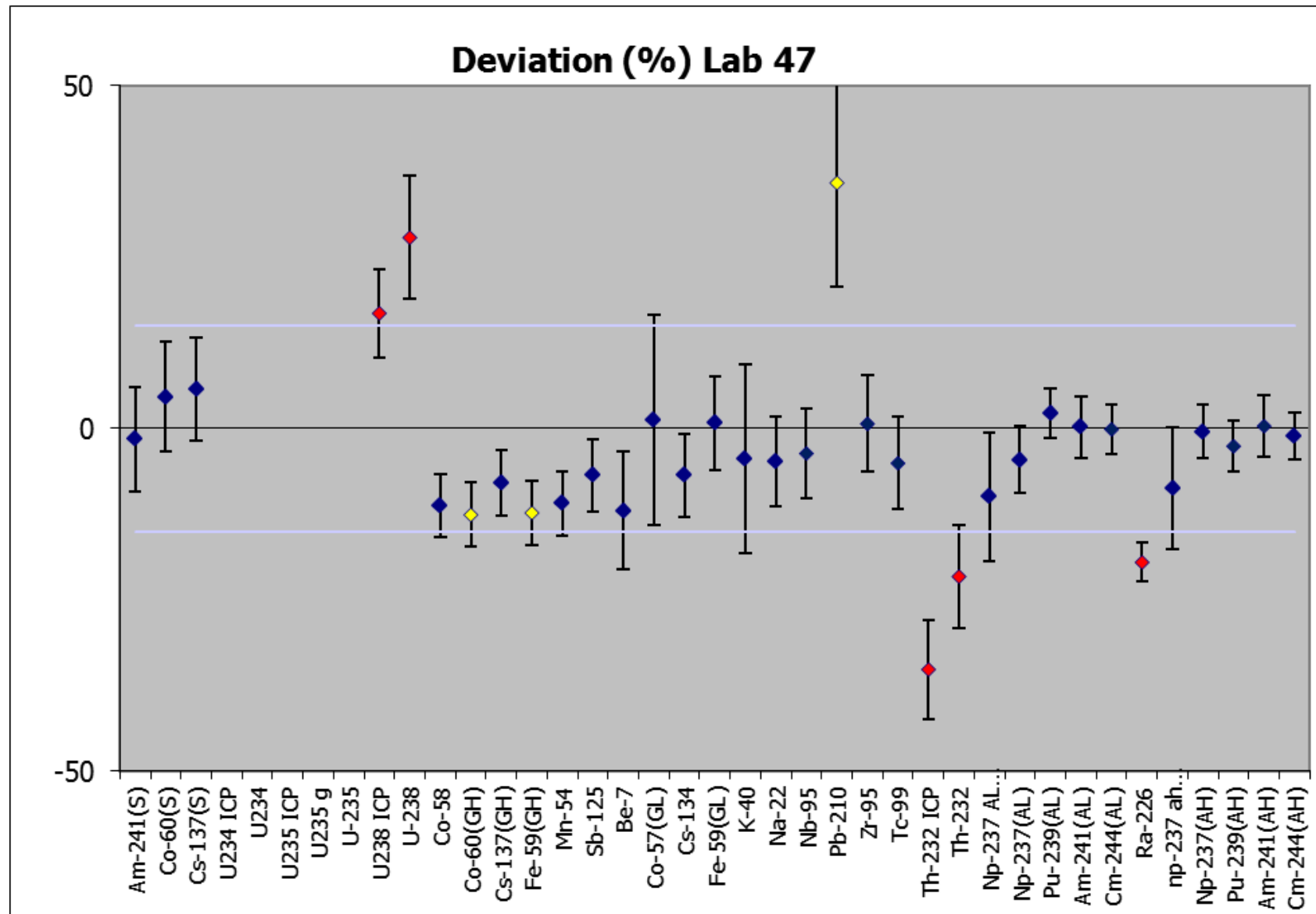
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Nuclide	Lab 45	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.86 ± 0.08 (± 10 %)	0.814 ± 0.022 (± 2.8 %)	5.7	1.12	0.98
Co-58	19.1 ± 3.2 (± 16 %)	18.54 ± 0.28 (± 1.6 %)	3.2	0.37	0.55
Co-60(GH)	18.6 ± 1.4 (± 8 %)	18.73 ± 0.08 (± 0.42 %)	-0.8	-0.22	-0.13
Cs-137(GH)	7.5 ± 0.6 (± 8 %)	7.15 ± 0.14 (± 2.0 %)	4.8	1.24	0.83
Fe-59(GH)	16.5 ± 2.0 (± 12 %)	15.07 ± 0.12 (± 0.8 %)	9.3	1.39	1.59
Mn-54	15.8 ± 1.2 (± 8 %)	14.88 ± 0.12 (± 0.8 %)	6.3	1.48	1.08
Sb-125	2.29 ± 0.26 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	-0.3	-0.05	-0.05



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Nuclide	Lab 46	Assigned Value	Deviation	zeta	z score
Be-7	16.0 ± 2.2 (± 14 %)	17.7 ± 0.6 (± 3.4 %)	-9.5	-1.52	-1.64
Co-57(GL)	2.40 ± 0.20 (± 8 %)	2.352 ± 0.032 (± 1.4 %)	2.0	0.47	0.35
Cs-134	6.3 ± 0.8 (± 12 %)	6.28 ± 0.20 (± 3 %)	0.3	0.05	0.05
Fe-59(GL)	11.2 ± 1.4 (± 12 %)	10.85 ± 0.22 (± 2.0 %)	2.9	0.48	0.50
K-40	17.5 ± 2.6 (± 16 %)	16.9 ± 1.6 (± 10 %)	4.0	0.44	0.69
Na-22	11.3 ± 1.0 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-4.1	-0.99	-0.70
Nb-95	12.7 ± 1.8 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	-2.2	-0.30	-0.37
Pb-210	13.9 ± 2.2 (± 16 %)	15.31 ± 0.34 (± 2.2 %)	-9.4	-1.25	-1.61
Zr-95	6.0 ± 0.5 (± 8 %)	5.88 ± 0.10 (± 1.6 %)	2.1	0.48	0.35
Tc-99	1.38 ± 0.14 (± 10 %)	1.633 ± 0.008 (± 0.44 %)	-15.5	-3.60	-2.66
Pu-241	0.82 ± 0.14 (± 18 %)	0.799 ± 0.018 (± 2.2 %)	2.6	0.30	0.45
Th-232	3.8 ± 0.8 (± 18 %)	3.76 ± 0.08 (± 2.0 %)	0.7	0.08	0.13
Pu-239(AL)	16.0 ± 2.8 (± 18 %)	18.18 ± 0.08 (± 0.38 %)	-11.9	-1.58	-2.04
Am-241(AL)	3.4 ± 1.4 (± 40 %)	3.532 ± 0.022 (± 0.6 %)	-2.3	-0.12	-0.40
Cm-244(AL)	11.6 ± 2.8 (± 24 %)	10.97 ± 0.08 (± 0.8 %)	6.2	0.48	1.06
Ra-226	3.44 ± 0.40 (± 12 %)	3.81 ± 0.10 (± 2.6 %)	-9.7	-1.83	-1.67
Pu-239(AH)	5.8 ± 1.0 (± 16 %)	6.138 ± 0.026 (± 0.42 %)	-5.0	-0.64	-0.86
Am-241(AH)	3.3 ± 0.8 (± 22 %)	3.786 ± 0.016 (± 0.42 %)	-12.8	-1.39	-2.21
Cm-244(AH)	13.4 ± 2.2 (± 16 %)	14.63 ± 0.10 (± 0.6 %)	-8.6	-1.12	-1.48

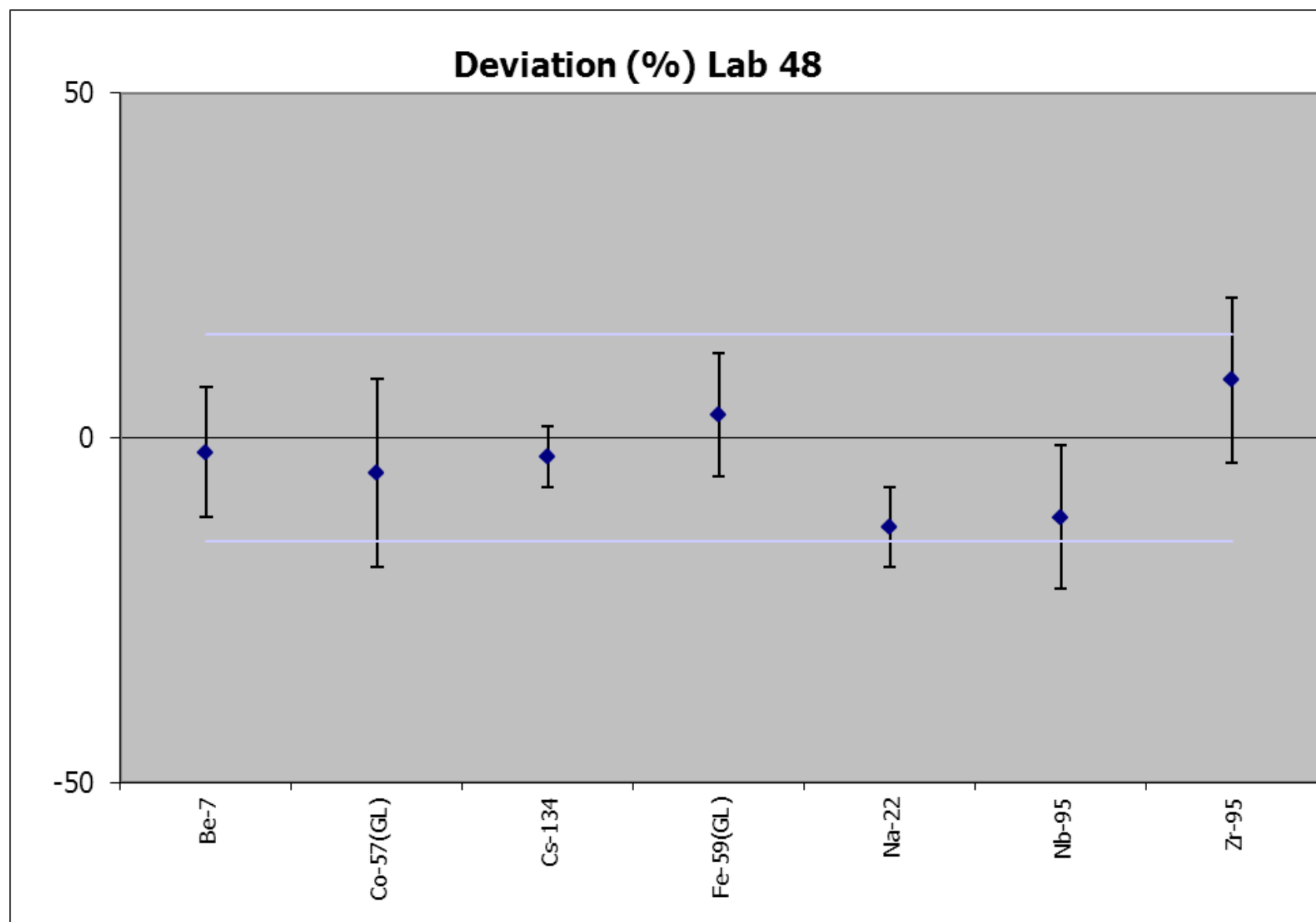


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Nuclide	Lab 47	Assigned Value	Deviation	zeta	z score
Am-241(S)	6.7 ± 0.8 (± 12 %)	6.8 ± 0.8 (± 10 %)	-1.6	-0.21	-0.27
Co-60(S)	9.6 ± 1.2 (± 14 %)	9.1 ± 0.8 (± 8 %)	4.7	0.59	0.80
Cs-137(S)	10.0 ± 1.2 (± 12 %)	9.5 ± 0.8 (± 8 %)	5.7	0.77	0.98
U-234 MS	16.56 ± 0.46 (± 2.8 %)	7.8 ± 1.0 (± 12 %)	112.6	18.20	19.34
U-234	17.2 ± 1.6 (± 10 %)	7.8 ± 1.0 (± 12 %)	121.3	11.08	20.84
U-235 MS	0.712 ± 0.020 (± 2.8 %)	0.368 ± 0.030 (± 8 %)	93.5	19.39	16.06
U-235 g	0.73 ± 0.10 (± 14 %)	0.368 ± 0.030 (± 8 %)	99.2	7.27	17.04
U-235	0.83 ± 0.16 (± 20 %)	0.368 ± 0.030 (± 8 %)	124.5	5.56	21.38
U-238 MS	9.20 ± 0.26 (± 2.8 %)	7.9 ± 1.0 (± 12 %)	16.8	3.00	2.89
U-238	10.1 ± 1.0 (± 10 %)	7.9 ± 1.0 (± 12 %)	27.9	3.52	4.78
Co-58	16.5 ± 1.8 (± 10 %)	18.54 ± 0.28 (± 1.6 %)	-11.2	-2.42	-1.93
Co-60(GH)	16.4 ± 1.8 (± 12 %)	18.73 ± 0.08 (± 0.42 %)	-12.6	-2.70	-2.16
Cs-137(GH)	6.6 ± 0.8 (± 10 %)	7.15 ± 0.14 (± 2.0 %)	-7.9	-1.63	-1.35
Fe-59(GH)	13.2 ± 1.4 (± 12 %)	15.07 ± 0.12 (± 0.8 %)	-12.3	-2.60	-2.11
Mn-54	13.2 ± 1.4 (± 10 %)	14.88 ± 0.12 (± 0.8 %)	-10.9	-2.35	-1.88
Sb-125	2.14 ± 0.24 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	-6.8	-1.30	-1.17
Be-7	15.6 ± 3.0 (± 20 %)	17.7 ± 0.6 (± 3.4 %)	-12.0	-1.39	-2.06
Co-57(GL)	2.4 ± 0.8 (± 30 %)	2.352 ± 0.032 (± 1.4 %)	1.2	0.08	0.20
Cs-134	5.8 ± 0.8 (± 14 %)	6.28 ± 0.20 (± 3 %)	-6.9	-1.13	-1.18
Fe-59(GL)	10.9 ± 1.4 (± 14 %)	10.85 ± 0.22 (± 2.0 %)	0.8	0.12	0.14
K-40	16.1 ± 4.4 (± 28 %)	16.9 ± 1.6 (± 10 %)	-4.5	-0.32	-0.77
Na-22	11.2 ± 1.6 (± 14 %)	11.74 ± 0.26 (± 2.2 %)	-4.8	-0.73	-0.82
Nb-95	12.5 ± 1.6 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	-3.6	-0.56	-0.62
Pb-210	20.8 ± 4.6 (± 22 %)	15.31 ± 0.34 (± 2.2 %)	35.8	2.38	6.15
Zr-95	5.9 ± 0.8 (± 14 %)	5.88 ± 0.10 (± 1.6 %)	0.7	0.10	0.12
Tc-99	1.55 ± 0.22 (± 14 %)	1.633 ± 0.008 (± 0.44 %)	-5.1	-0.75	-0.87
Th-232 ICP	2.4 ± 0.6 (± 22 %)	3.76 ± 0.08 (± 2.0 %)	-35.1	-4.85	-6.04
Th-232	3.0 ± 0.6 (± 20 %)	3.76 ± 0.08 (± 2.0 %)	-21.6	-2.88	-3.71
Np-237 (AL) MS	16.2 ± 3.4 (± 20 %)	17.95 ± 0.36 (± 2.0 %)	-10.0	-1.06	-1.71
Np-237(AL)	17.1 ± 1.8 (± 10 %)	17.95 ± 0.36 (± 2.0 %)	-4.6	-0.94	-0.79
Pu-239(AL)	18.6 ± 1.4 (± 8 %)	18.18 ± 0.08 (± 0.38 %)	2.2	0.60	0.38
Am-241(AL)	3.54 ± 0.32 (± 10 %)	3.532 ± 0.022 (± 0.6 %)	0.2	0.05	0.04
Cm-244(AL)	11.0 ± 0.8 (± 8 %)	10.97 ± 0.08 (± 0.8 %)	-0.1	-0.03	-0.02

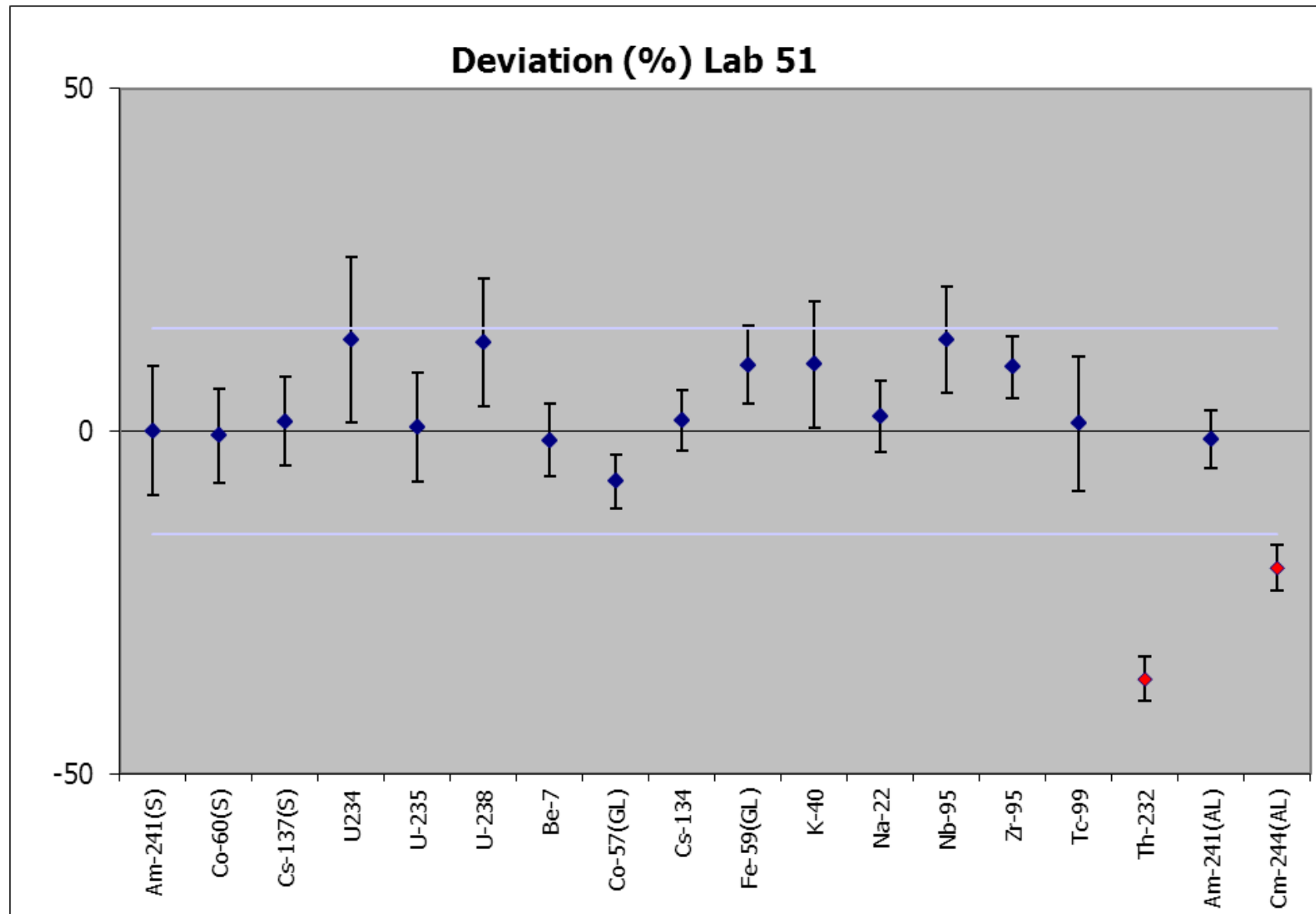
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Nuclide	Lab 47	Assigned Value	Deviation	zeta	z score
Ra-226	3.07 ± 0.20 ($\pm 8 \%$)	3.81 ± 0.10 ($\pm 2.6 \%$)	-19.5	-6.67	-3.35
Np-237 (AH) MS	10.0 ± 2.0 ($\pm 20 \%$)	10.94 ± 0.22 ($\pm 2.0 \%$)	-8.7	-0.99	-1.50
Np-237(AH)	10.9 ± 0.8 ($\pm 8 \%$)	10.94 ± 0.22 ($\pm 2.0 \%$)	-0.4	-0.11	-0.07
Pu-239(AH)	5.98 ± 0.46 ($\pm 8 \%$)	6.138 ± 0.026 ($\pm 0.42 \%$)	-2.6	-0.69	-0.44
Am-241(AH)	3.80 ± 0.34 ($\pm 10 \%$)	3.786 ± 0.016 ($\pm 0.42 \%$)	0.4	0.08	0.06
Cm-244(AH)	14.5 ± 1.0 ($\pm 8 \%$)	14.63 ± 0.10 ($\pm 0.6 \%$)	-1.1	-0.32	-0.19



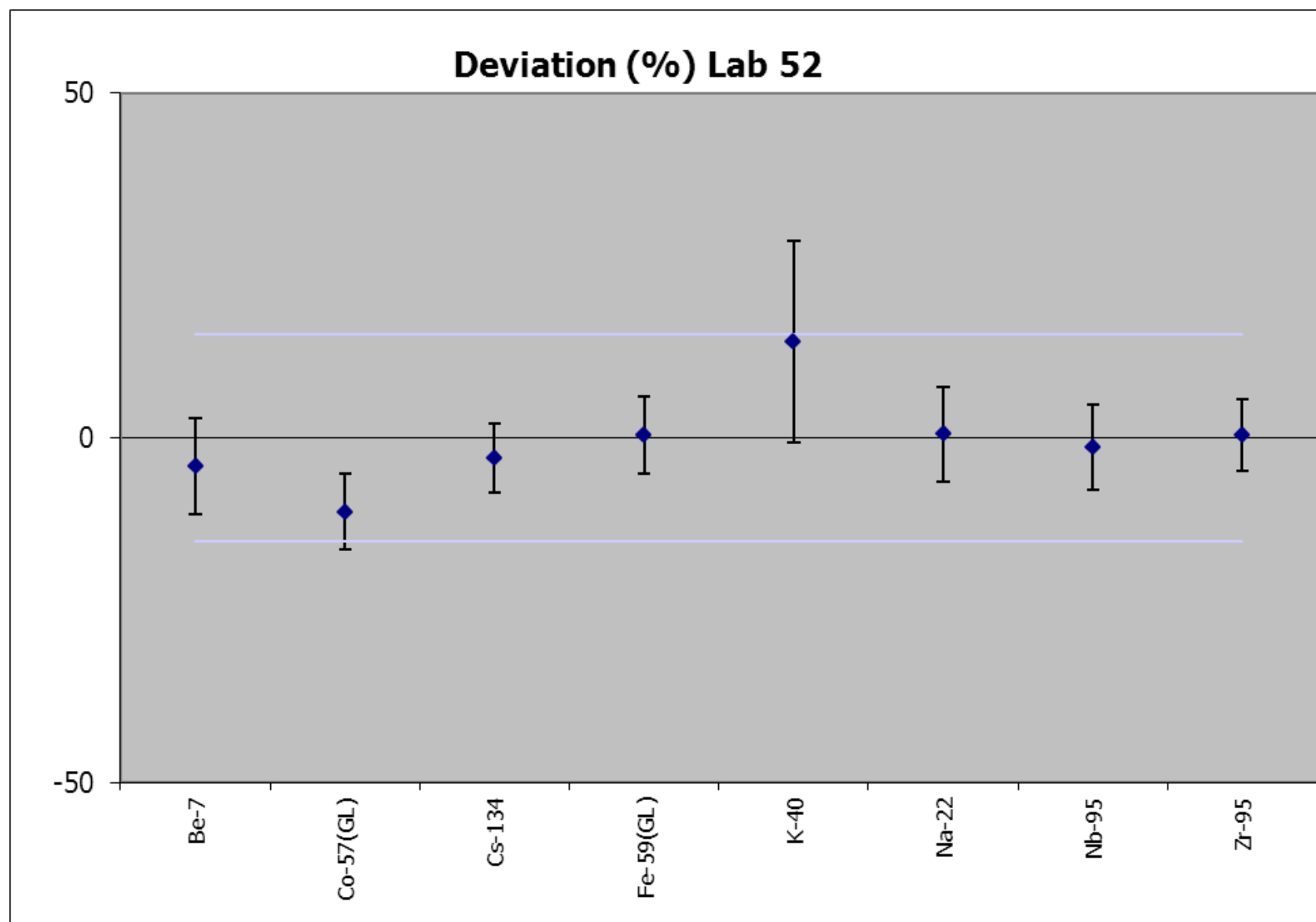
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Nuclide	Lab 48	Assigned Value	Deviation	zeta	z score
Be-7	17.4 ± 3.2 (± 18 %)	17.7 ± 0.6 (± 3.4 %)	-2.1	-0.23	-0.37
Co-57(GL)	2.2 ± 0.8 (± 28 %)	2.352 ± 0.032 (± 1.4 %)	-5.2	-0.38	-0.89
Cs-134	6.1 ± 0.6 (± 10 %)	6.28 ± 0.20 (± 3 %)	-2.7	-0.62	-0.47
Fe-59(GL)	11.2 ± 2.0 (± 18 %)	10.85 ± 0.22 (± 2.0 %)	3.4	0.38	0.58
Na-22	10.2 ± 1.4 (± 14 %)	11.74 ± 0.26 (± 2.2 %)	-12.9	-2.22	-2.21
Nb-95	11.5 ± 2.8 (± 24 %)	12.96 ± 0.22 (± 1.8 %)	-11.4	-1.09	-1.96
Zr-95	6.4 ± 1.4 (± 22 %)	5.88 ± 0.10 (± 1.6 %)	8.4	0.70	1.43



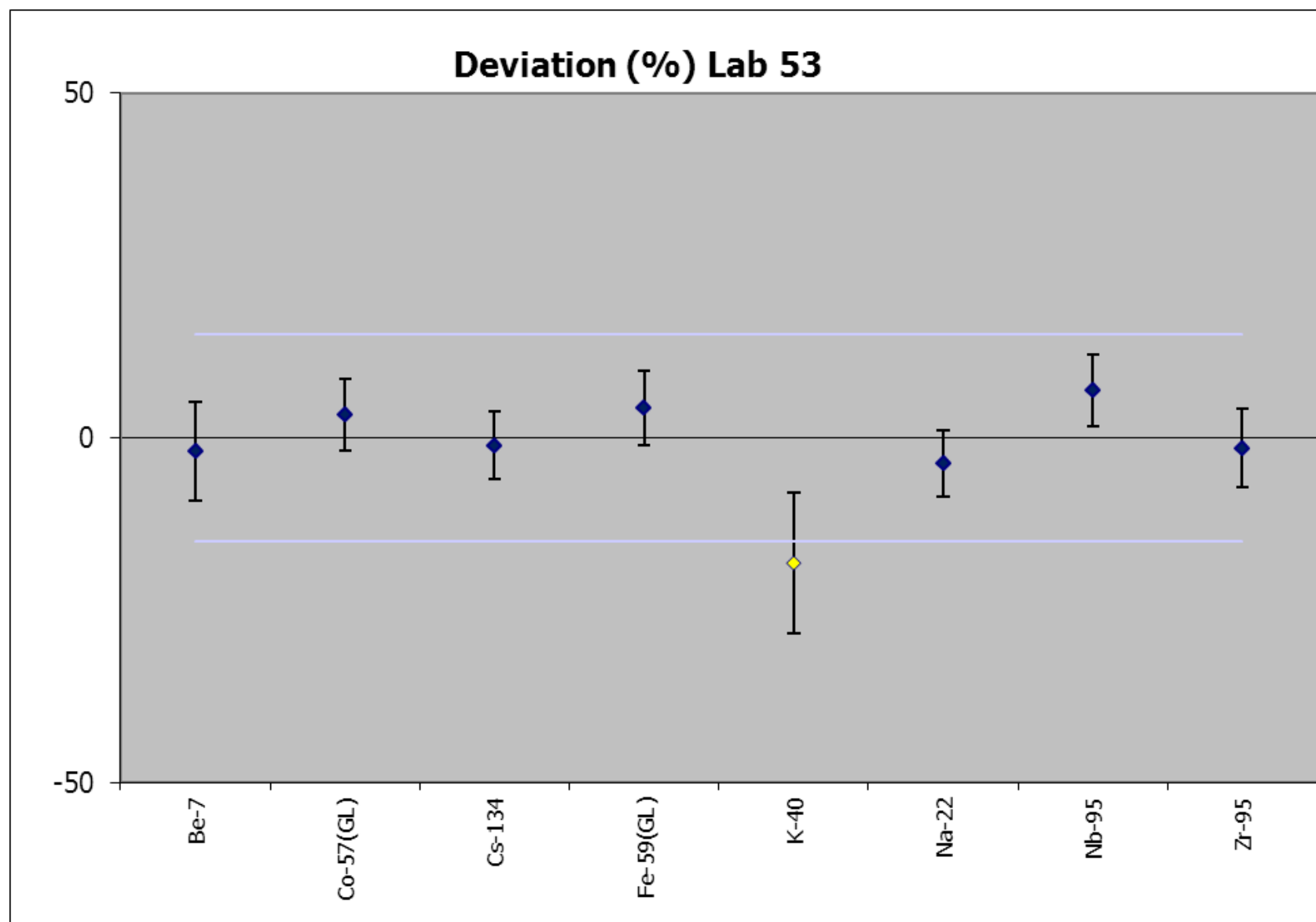
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	Lab 51	Assigned Value	Deviation	zeta	z score
Am-241(S)	6.8 ± 1.0 (± 14 %)	6.8 ± 0.8 (± 10 %)	0.1	0.01	0.01
Co-60(S)	9.1 ± 1.0 (± 12 %)	9.1 ± 0.8 (± 8 %)	-0.4	-0.06	-0.07
Cs-137(S)	9.6 ± 1.0 (± 10 %)	9.5 ± 0.8 (± 8 %)	1.4	0.22	0.24
U-234	8.8 ± 1.6 (± 18 %)	7.8 ± 1.0 (± 12 %)	13.0	1.12	2.23
U-235	0.370 ± 0.040 (± 12 %)	0.368 ± 0.030 (± 8 %)	0.6	0.08	0.10
U-238	8.8 ± 1.2 (± 14 %)	7.9 ± 1.0 (± 12 %)	11.7	1.26	2.01
Be-7	17.5 ± 1.8 (± 10 %)	17.7 ± 0.6 (± 3.4 %)	-1.3	-0.24	-0.22
Co-57(GL)	2.18 ± 0.18 (± 8 %)	2.352 ± 0.032 (± 1.4 %)	-7.3	-1.88	-1.26
Cs-134	6.4 ± 0.6 (± 8 %)	6.28 ± 0.20 (± 3 %)	1.6	0.36	0.27
Fe-59(GL)	11.9 ± 1.2 (± 10 %)	10.85 ± 0.22 (± 2.0 %)	9.7	1.72	1.66
K-40	18.5 ± 2.6 (± 14 %)	16.9 ± 1.6 (± 10 %)	9.8	1.09	1.68
Na-22	12.0 ± 1.2 (± 10 %)	11.74 ± 0.26 (± 2.2 %)	2.2	0.42	0.38
Nb-95	14.7 ± 2.0 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	13.4	1.73	2.31
Zr-95	6.4 ± 0.6 (± 8 %)	5.88 ± 0.10 (± 1.6 %)	9.4	2.09	1.61
Tc-99	1.65 ± 0.32 (± 20 %)	1.633 ± 0.008 (± 0.44 %)	1.1	0.11	0.18
Th-232	2.40 ± 0.24 (± 10 %)	3.76 ± 0.08 (± 2.0 %)	-36.2	-10.87	-6.22
Am-241(AL)	3.49 ± 0.30 (± 10 %)	3.532 ± 0.022 (± 0.6 %)	-1.2	-0.28	-0.20
Cm-244(AL)	8.8 ± 0.8 (± 8 %)	10.97 ± 0.08 (± 0.8 %)	-20.0	-6.06	-3.43



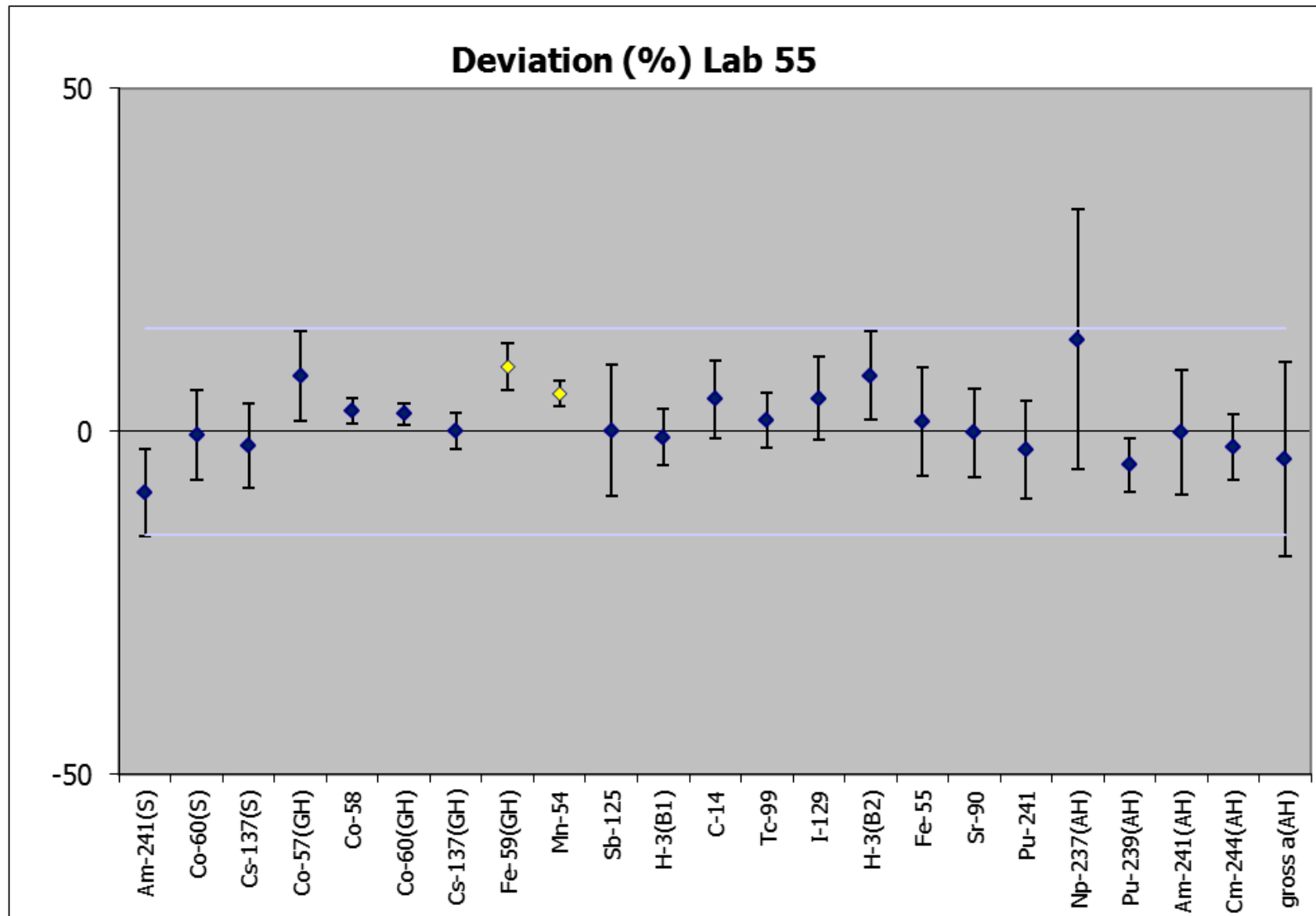
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Nuclide	Lab 52	Assigned Value	Deviation	zeta	z score
Be-7	17.0 ± 2.4 (± 14 %)	17.7 ± 0.6 (± 3.4 %)	-4.1	-0.59	-0.71
Co-57(GL)	2.10 ± 0.26 (± 12 %)	2.352 ± 0.032 (± 1.4 %)	-10.7	-1.92	-1.84
Cs-134	6.1 ± 0.6 (± 10 %)	6.28 ± 0.20 (± 3 %)	-2.9	-0.57	-0.49
Fe-59(GL)	10.9 ± 1.2 (± 12 %)	10.85 ± 0.22 (± 2.0 %)	0.5	0.08	0.08
K-40	19.2 ± 4.6 (± 24 %)	16.9 ± 1.6 (± 10 %)	13.9	0.97	2.39
Na-22	11.8 ± 1.6 (± 14 %)	11.74 ± 0.26 (± 2.2 %)	0.5	0.07	0.08
Nb-95	12.8 ± 1.6 (± 12 %)	12.96 ± 0.22 (± 1.8 %)	-1.2	-0.20	-0.21
Zr-95	5.9 ± 0.6 (± 10 %)	5.88 ± 0.10 (± 1.6 %)	0.4	0.07	0.06



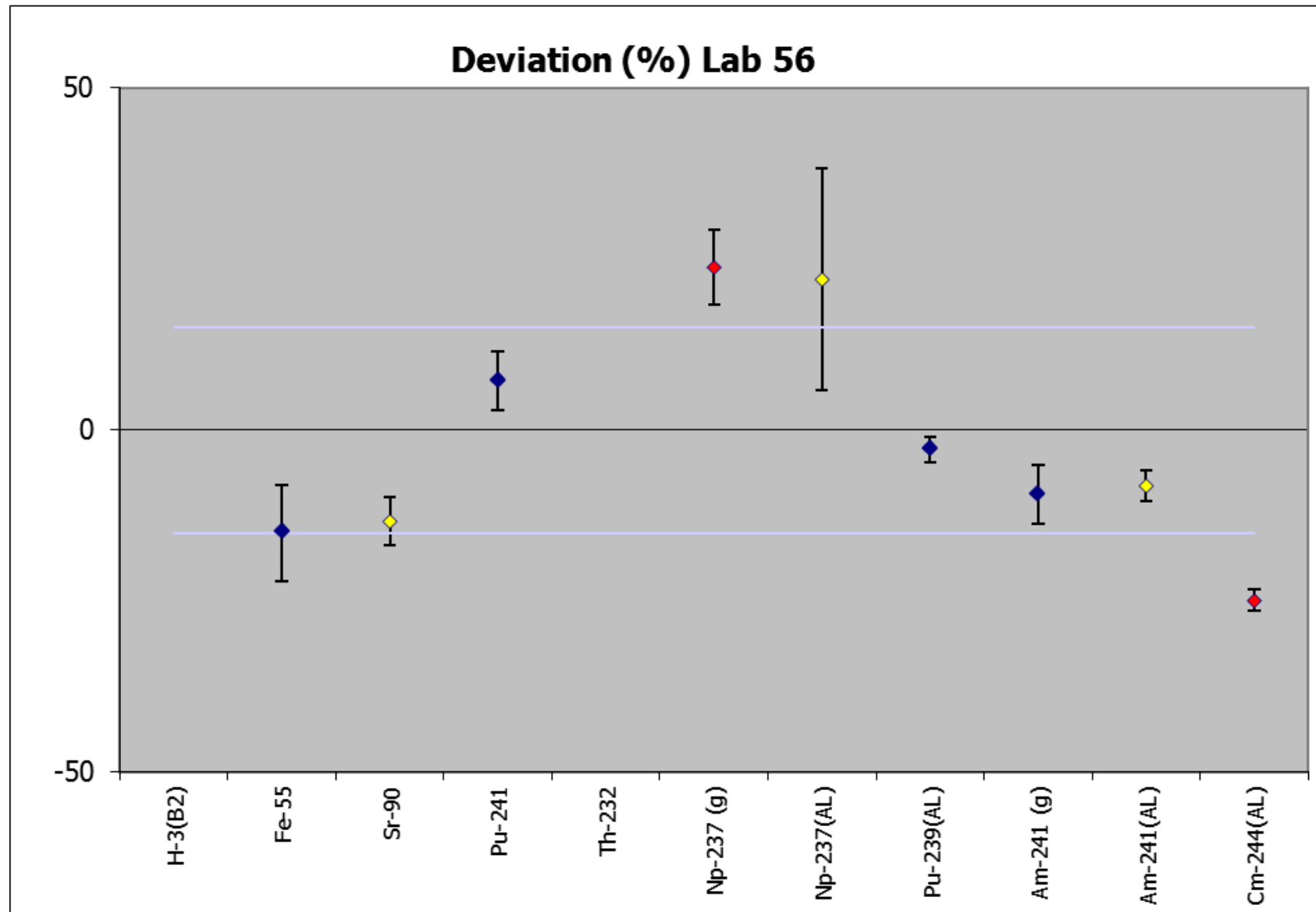
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Nuclide	Lab 53	Assigned Value	Deviation	zeta	z score
Be-7	17.4 ± 2.4 (± 14 %)	17.7 ± 0.6 (± 3.4 %)	-2.0	-0.27	-0.34
Co-57(GL)	2.43 ± 0.24 (± 10 %)	2.352 ± 0.032 (± 1.4 %)	3.3	0.64	0.57
Cs-134	6.2 ± 0.6 (± 10 %)	6.28 ± 0.20 (± 3 %)	-1.1	-0.23	-0.19
Fe-59(GL)	11.3 ± 1.2 (± 10 %)	10.85 ± 0.22 (± 2.0 %)	4.3	0.81	0.74
K-40	13.8 ± 3.2 (± 24 %)	16.9 ± 1.6 (± 10 %)	-18.2	-1.73	-3.12
Na-22	11.3 ± 1.2 (± 10 %)	11.74 ± 0.26 (± 2.2 %)	-3.7	-0.77	-0.63
Nb-95	13.9 ± 1.4 (± 10 %)	12.96 ± 0.22 (± 1.8 %)	7.0	1.36	1.21
Zr-95	5.8 ± 0.8 (± 12 %)	5.88 ± 0.10 (± 1.6 %)	-1.5	-0.27	-0.26



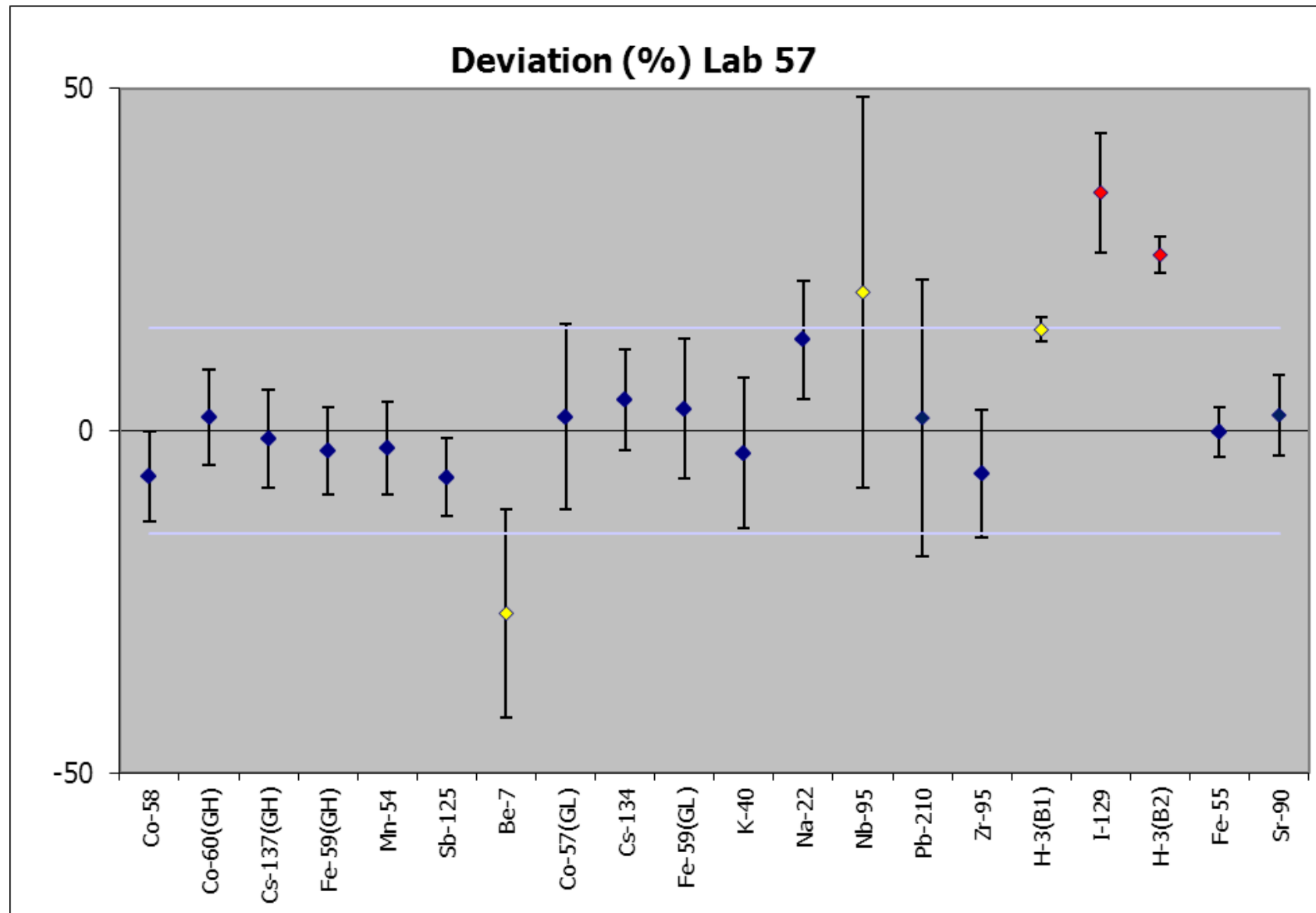
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Nuclide	Lab 55	Assigned Value	Deviation	zeta	z score
Am-241(S)	6.2 ± 0.8 (± 10 %)	6.8 ± 0.8 (± 10 %)	-8.9	-1.33	-1.53
Co-60(S)	9.1 ± 1.0 (± 10 %)	9.1 ± 0.8 (± 8 %)	-0.5	-0.08	-0.08
Cs-137(S)	9.3 ± 1.0 (± 10 %)	9.5 ± 0.8 (± 8 %)	-2.0	-0.32	-0.34
Co-57(GH)	0.88 ± 0.10 (± 12 %)	0.814 ± 0.022 (± 2.8 %)	8.2	1.25	1.40
Co-58	19.1 ± 0.6 (± 3.2 %)	18.54 ± 0.28 (± 1.6 %)	3.0	1.67	0.51
Co-60(GH)	19.2 ± 0.6 (± 3 %)	18.73 ± 0.08 (± 0.42 %)	2.5	1.62	0.44
Cs-137(GH)	7.16 ± 0.34 (± 4.8 %)	7.15 ± 0.14 (± 2.0 %)	0.1	0.03	0.01
Fe-59(GH)	16.5 ± 1.0 (± 6 %)	15.07 ± 0.12 (± 0.8 %)	9.5	2.73	1.63
Mn-54	15.7 ± 0.6 (± 3.4 %)	14.88 ± 0.12 (± 0.8 %)	5.5	2.99	0.95
Sb-125	2.30 ± 0.44 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	0.1	0.01	0.02
H-3(B1)	1.48 ± 0.12 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	-0.8	-0.20	-0.14
C-14	0.84 ± 0.10 (± 12 %)	0.807 ± 0.014 (± 1.6 %)	4.7	0.82	0.80
Tc-99	1.66 ± 0.14 (± 8 %)	1.633 ± 0.008 (± 0.44 %)	1.7	0.42	0.29
I-129	0.410 ± 0.046 (± 12 %)	0.3909 ± 0.0040 (± 1.0 %)	4.9	0.81	0.84
H-3(B2)	0.371 ± 0.044 (± 12 %)	0.3429 ± 0.0048 (± 1.4 %)	8.2	1.28	1.41
Fe-55	1.48 ± 0.22 (± 16 %)	1.46 ± 0.06 (± 3.6 %)	1.5	0.19	0.25
Sr-90	1.61 ± 0.20 (± 14 %)	1.613 ± 0.008 (± 0.42 %)	-0.2	-0.03	-0.03
Pu-241	0.78 ± 0.12 (± 14 %)	0.799 ± 0.018 (± 2.2 %)	-2.6	-0.37	-0.45
Np-237(AH)	12.4 ± 4.2 (± 34 %)	10.94 ± 0.22 (± 2.0 %)	13.4	0.71	2.30
Pu-239(AH)	5.84 ± 0.48 (± 8 %)	6.138 ± 0.026 (± 0.42 %)	-4.9	-1.24	-0.83
Am-241(AH)	3.8 ± 0.8 (± 18 %)	3.786 ± 0.016 (± 0.42 %)	-0.2	-0.02	-0.03
Cm-244(AH)	14.3 ± 1.4 (± 10 %)	14.63 ± 0.10 (± 0.6 %)	-2.2	-0.48	-0.39
gross α (AH)	41.9 ± 2.8 (± 8 %)	44 ± 12 (± 28 %)	-4.0	-0.27	-0.69



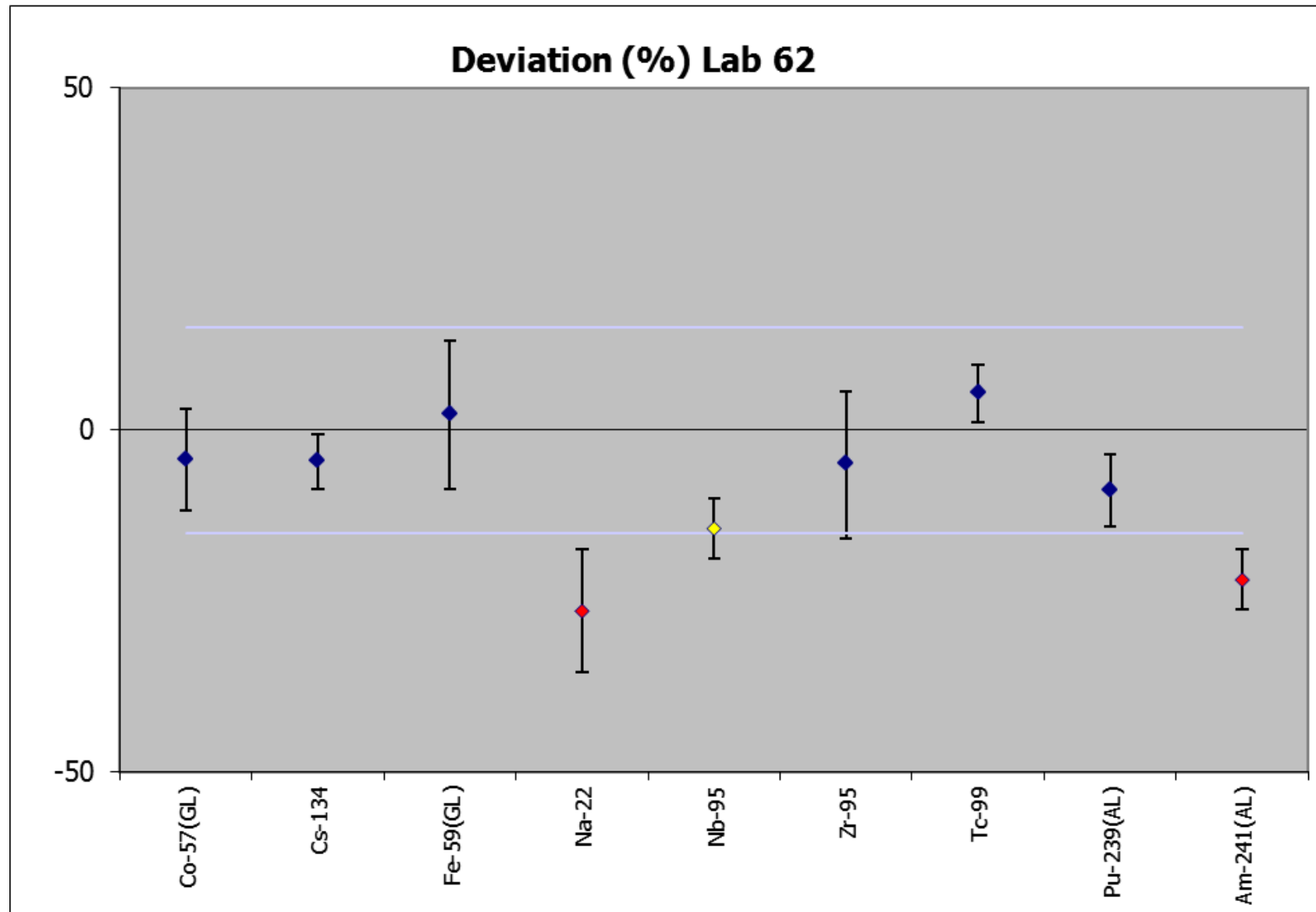
NPL Report IR 27

Nuclide	Lab 56	Assigned Value	Deviation	zeta	z score
H-3(B2)	0.60 ± 0.10 (± 16 %)	0.3429 ± 0.0048 (± 1.4 %)	74.4	5.66	12.77
Fe-55	1.24 ± 0.20 (± 16 %)	1.46 ± 0.06 (± 3.6 %)	-15.0	-2.12	-2.57
Sr-90	1.40 ± 0.12 (± 8 %)	1.613 ± 0.008 (± 0.42 %)	-13.3	-3.83	-2.29
Pu-241	0.86 ± 0.08 (± 8 %)	0.799 ± 0.018 (± 2.2 %)	7.1	1.67	1.22
Th-232	17.2 ± 1.8 (± 12 %)	3.76 ± 0.08 (± 2.0 %)	357.5	14.61	61.39
Np-237 (g)	22.2 ± 2.0 (± 10 %)	17.95 ± 0.36 (± 2.0 %)	23.8	4.33	4.09
Np-237(AL)	22 ± 6 (± 26 %)	17.95 ± 0.36 (± 2.0 %)	22.0	1.36	3.78
Pu-239(AL)	17.7 ± 0.8 (± 3.8 %)	18.18 ± 0.08 (± 0.38 %)	-2.9	-1.57	-0.49
Am-241 (g)	3.2 ± 0.3 (± 10 %)	3.532 ± 0.022 (± 0.6 %)	-9.4	-2.21	-1.61
Am-241(AL)	3.24 ± 0.16 (± 4.8 %)	3.532 ± 0.022 (± 0.6 %)	-8.1	-3.65	-1.40
Cm-244(AL)	8.24 ± 0.34 (± 4.2 %)	10.97 ± 0.08 (± 0.8 %)	-24.9	-15.72	-4.28



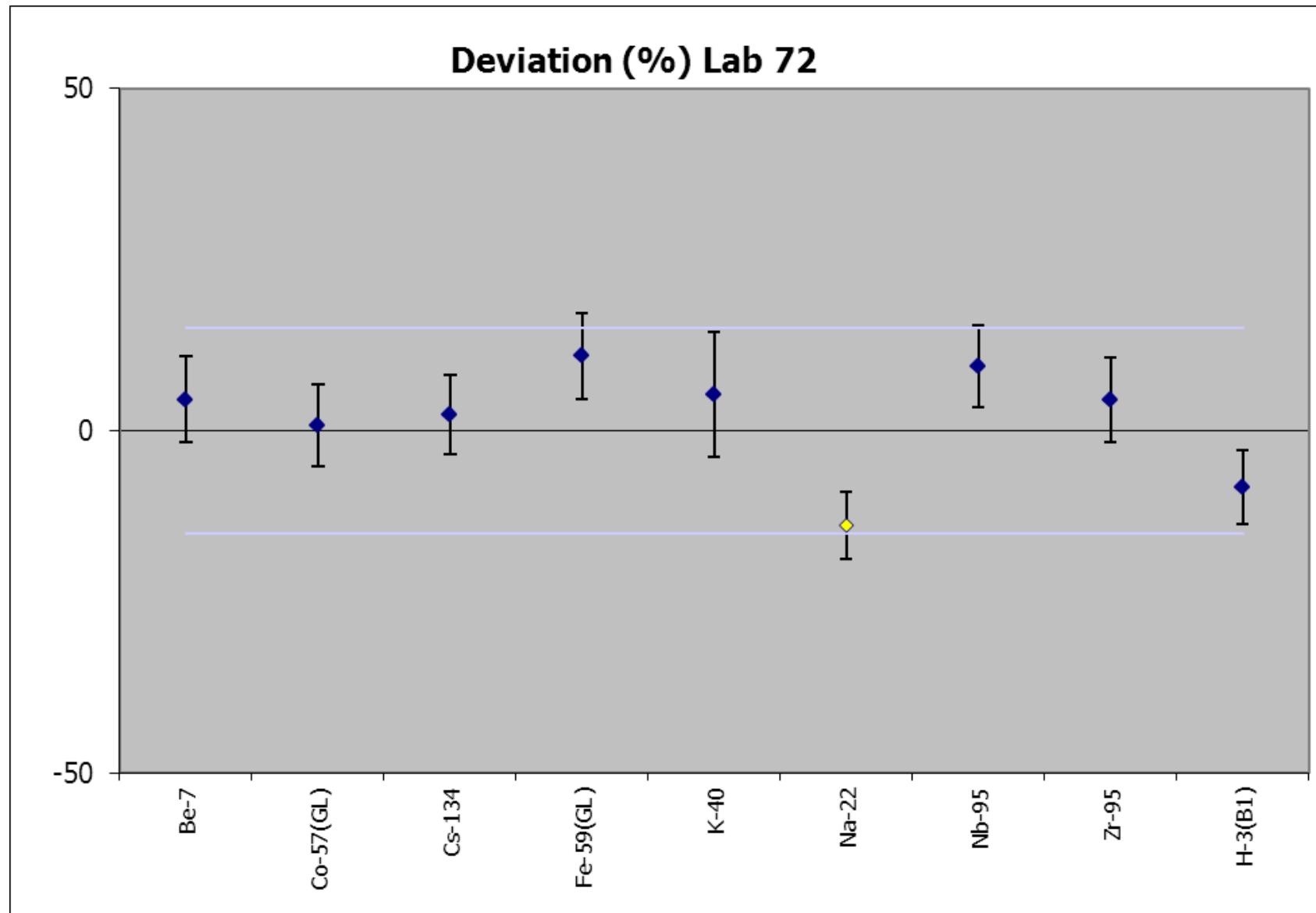
NPL Report IR 27

Nuclide	Lab 57	Assigned Value	Deviation	zeta	z score
Co-58	17.3 ± 2.4 (± 14 %)	18.54 ± 0.28 (± 1.6 %)	-6.7	-1.03	-1.15
Co-60(GH)	19.1 ± 2.6 (± 14 %)	18.73 ± 0.08 (± 0.42 %)	2.0	0.29	0.34
Cs-137(GH)	7.1 ± 1.0 (± 14 %)	7.15 ± 0.14 (± 2.0 %)	-1.2	-0.16	-0.20
Fe-59(GH)	14.6 ± 2.0 (± 14 %)	15.07 ± 0.12 (± 0.8 %)	-2.9	-0.46	-0.51
Mn-54	14.5 ± 2.0 (± 14 %)	14.88 ± 0.12 (± 0.8 %)	-2.5	-0.38	-0.43
Sb-125	2.14 ± 0.26 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	-6.8	-1.20	-1.17
Be-7	13 ± 6 (± 42 %)	17.7 ± 0.6 (± 3.4 %)	-26.7	-1.74	-4.58
Co-57(GL)	2.4 ± 0.8 (± 26 %)	2.352 ± 0.032 (± 1.4 %)	2.0	0.15	0.35
Cs-134	6.6 ± 1.0 (± 14 %)	6.28 ± 0.20 (± 3 %)	4.5	0.61	0.76
Fe-59(GL)	11.2 ± 2.2 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	3.2	0.32	0.55
K-40	16.3 ± 3.4 (± 20 %)	16.9 ± 1.6 (± 10 %)	-3.3	-0.29	-0.56
Na-22	13.3 ± 2.0 (± 16 %)	11.74 ± 0.26 (± 2.2 %)	13.3	1.55	2.28
Nb-95	16 ± 8 (± 48 %)	12.96 ± 0.22 (± 1.8 %)	20.4	0.71	3.50
Pb-210	16 ± 6 (± 40 %)	15.31 ± 0.34 (± 2.2 %)	1.9	0.09	0.32
Zr-95	5.5 ± 1.2 (± 20 %)	5.88 ± 0.10 (± 1.6 %)	-6.3	-0.67	-1.08
H-3(B1)	1.713 ± 0.048 (± 2.8 %)	1.493 ± 0.020 (± 1.4 %)	14.8	8.42	2.54
I-129	0.53 ± 0.08 (± 14 %)	0.3909 ± 0.0040 (± 1.0 %)	35.1	4.02	6.02
H-3(B2)	0.431 ± 0.018 (± 4.0 %)	0.3429 ± 0.0048 (± 1.4 %)	25.7	9.97	4.41
Fe-55	1.46 ± 0.10 (± 8 %)	1.46 ± 0.06 (± 3.6 %)	-0.2	-0.06	-0.04
Sr-90	1.65 ± 0.20 (± 12 %)	1.613 ± 0.008 (± 0.42 %)	2.3	0.39	0.39



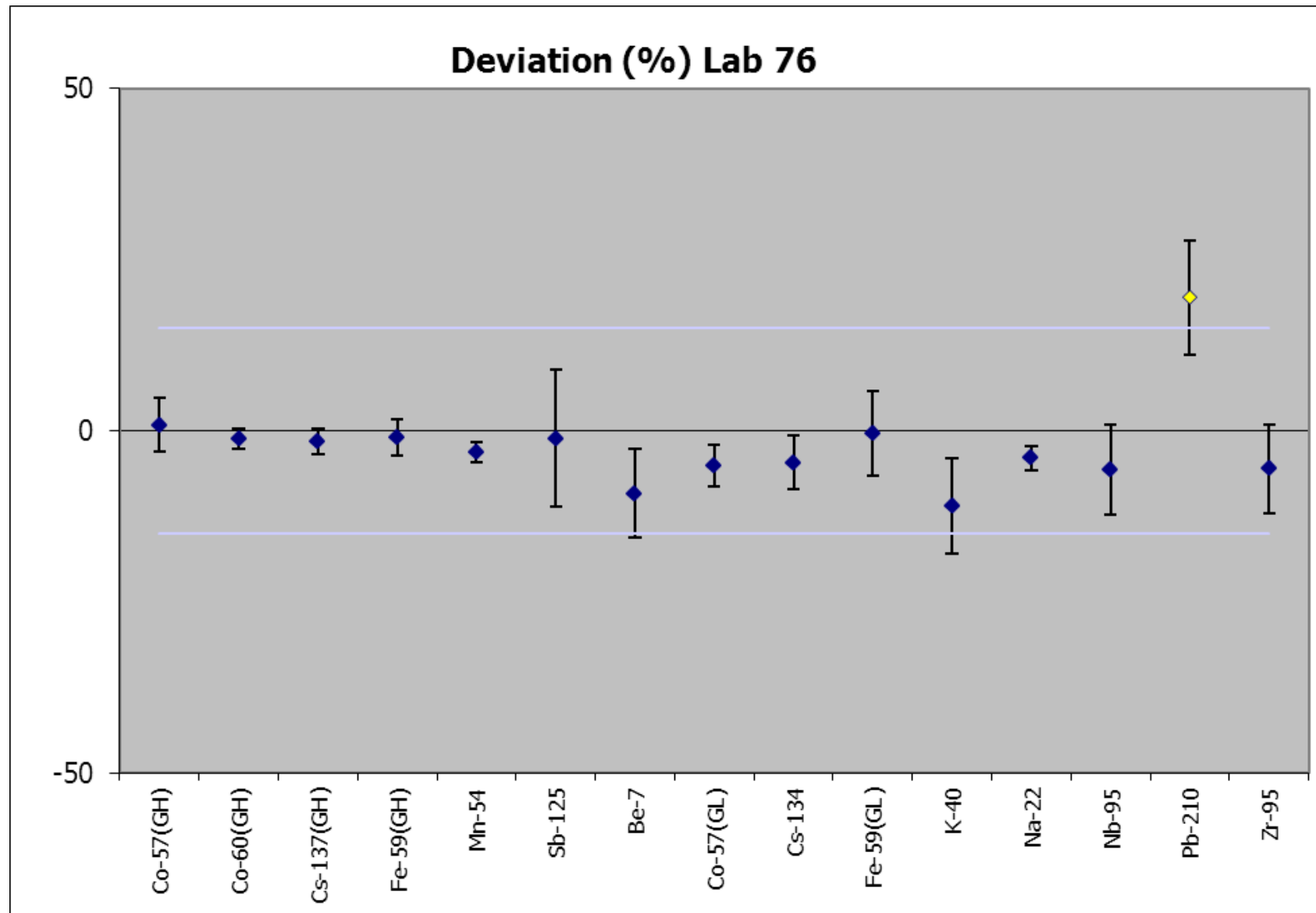
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Nuclide	Lab 62	Assigned Value	Deviation	zeta	z score
Co-57(GL)	2.25 ± 0.36 (± 16 %)	2.352 ± 0.032 (± 1.4 %)	-4.3	-0.58	-0.74
Cs-134	5.99 ± 0.46 (± 8 %)	6.28 ± 0.20 (± 3 %)	-4.6	-1.17	-0.79
Fe-59(GL)	11.1 ± 2.4 (± 22 %)	10.85 ± 0.22 (± 2.0 %)	2.3	0.21	0.39
Na-22	8.6 ± 2.0 (± 24 %)	11.74 ± 0.26 (± 2.2 %)	-26.4	-2.93	-4.54
Nb-95	11.1 ± 1.2 (± 10 %)	12.96 ± 0.22 (± 1.8 %)	-14.4	-3.20	-2.47
Zr-95	5.6 ± 1.2 (± 22 %)	5.88 ± 0.10 (± 1.6 %)	-5.1	-0.47	-0.87
Tc-99	1.72 ± 0.14 (± 8 %)	1.633 ± 0.008 (± 0.44 %)	5.4	1.27	0.92
Pu-239(AL)	16.6 ± 1.8 (± 12 %)	18.18 ± 0.08 (± 0.38 %)	-8.8	-1.69	-1.51
Am-241(AL)	2.76 ± 0.32 (± 12 %)	3.532 ± 0.022 (± 0.6 %)	-21.9	-4.97	-3.75



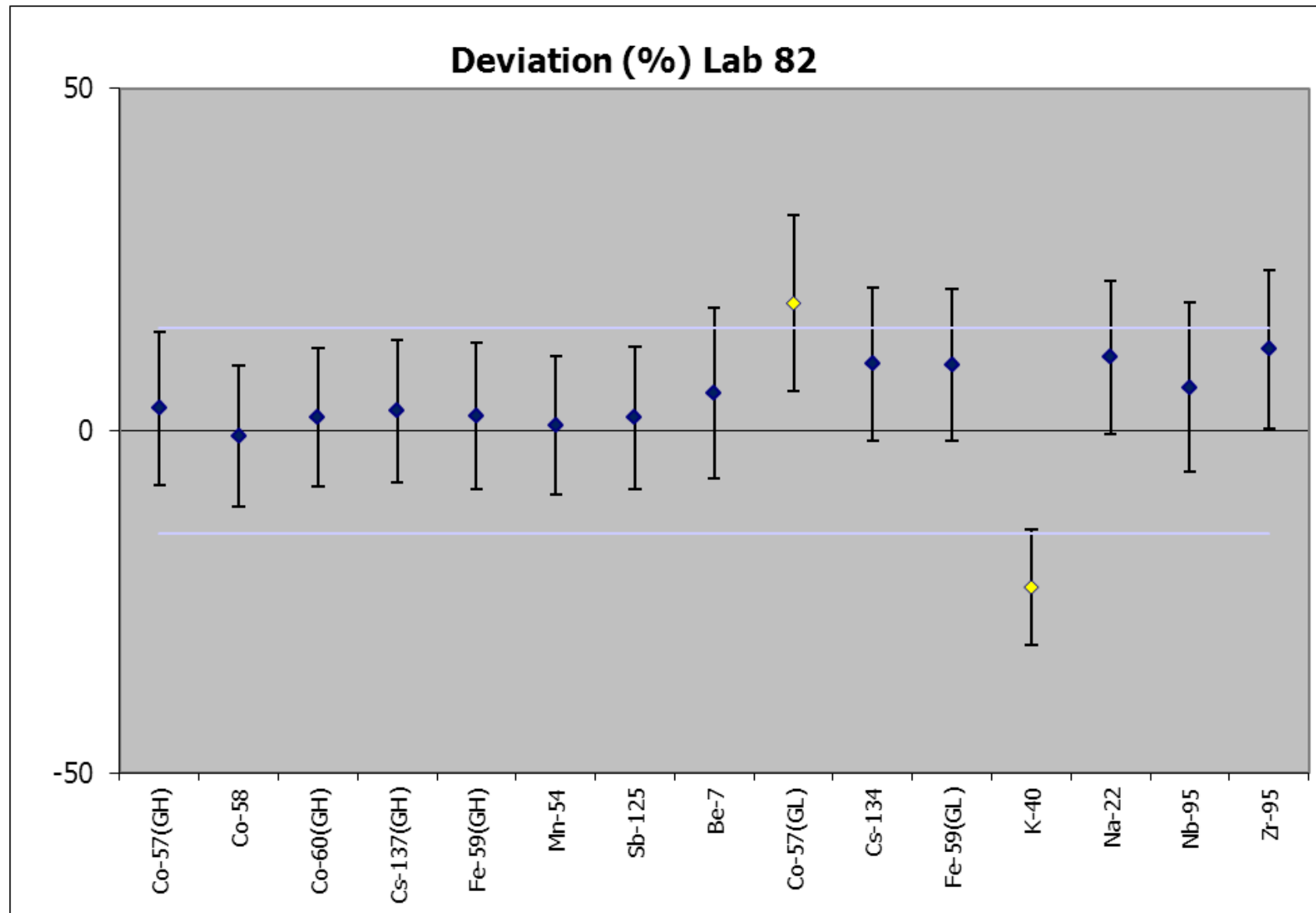
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Nuclide	Lab 72	Assigned Value	Deviation	zeta	z score
Be-7	18.5 ± 2.2 (± 12 %)	17.7 ± 0.6 (± 3.4 %)	4.5	0.72	0.78
Co-57(GL)	2.37 ± 0.28 (± 12 %)	2.352 ± 0.032 (± 1.4 %)	0.8	0.13	0.13
Cs-134	6.4 ± 0.8 (± 12 %)	6.28 ± 0.20 (± 3 %)	2.4	0.41	0.41
Fe-59(GL)	12.0 ± 1.4 (± 12 %)	10.85 ± 0.22 (± 2.0 %)	11.0	1.75	1.88
K-40	17.7 ± 2.6 (± 14 %)	16.9 ± 1.6 (± 10 %)	5.2	0.58	0.90
Na-22	10.1 ± 1.2 (± 12 %)	11.74 ± 0.26 (± 2.2 %)	-13.8	-2.83	-2.37
Nb-95	14.2 ± 1.6 (± 12 %)	12.96 ± 0.22 (± 1.8 %)	9.5	1.58	1.63
Zr-95	6.1 ± 0.8 (± 12 %)	5.88 ± 0.10 (± 1.6 %)	4.4	0.72	0.76
H-3(B1)	1.37 ± 0.16 (± 12 %)	1.493 ± 0.020 (± 1.4 %)	-8.2	-1.52	-1.41



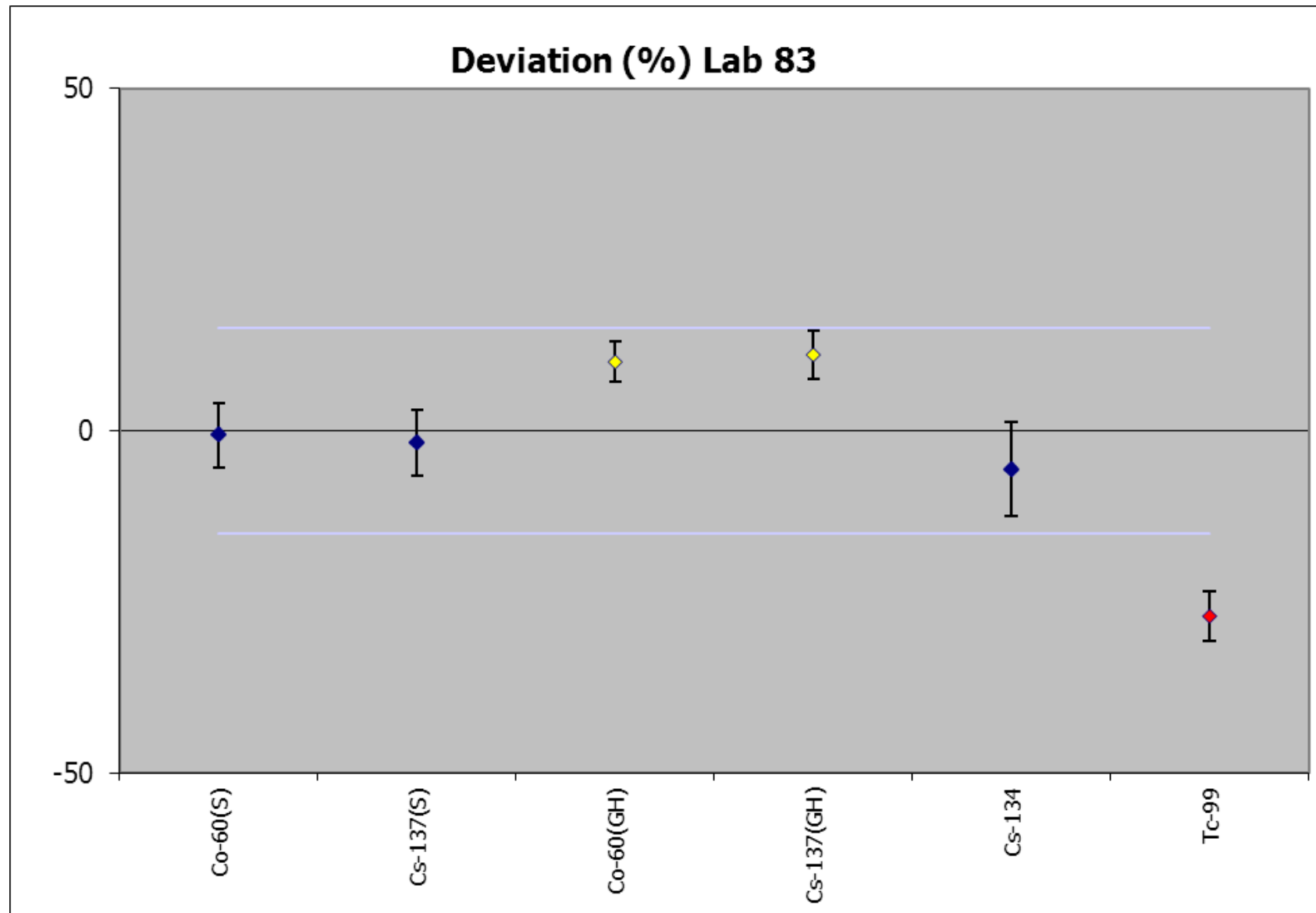
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Nuclide	Lab 76	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.82 ± 0.06 (± 8 %)	0.814 ± 0.022 (± 2.8 %)	0.8	0.20	0.14
Co-60(GH)	18.5 ± 0.6 (± 3 %)	18.73 ± 0.08 (± 0.42 %)	-1.2	-0.80	-0.21
Cs-137(GH)	7.04 ± 0.24 (± 3.4 %)	7.15 ± 0.14 (± 2.0 %)	-1.6	-0.82	-0.27
Fe-59(GH)	14.9 ± 0.8 (± 6 %)	15.07 ± 0.12 (± 0.8 %)	-1.0	-0.36	-0.16
Mn-54	14.41 ± 0.42 (± 3 %)	14.88 ± 0.12 (± 0.8 %)	-3.1	-2.15	-0.54
Sb-125	2.27 ± 0.46 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	-1.2	-0.12	-0.20
Be-7	16.1 ± 2.2 (± 14 %)	17.7 ± 0.6 (± 3.4 %)	-9.2	-1.42	-1.58
Co-57(GL)	2.23 ± 0.14 (± 6 %)	2.352 ± 0.032 (± 1.4 %)	-5.2	-1.70	-0.89
Cs-134	5.99 ± 0.46 (± 8 %)	6.28 ± 0.20 (± 3 %)	-4.6	-1.17	-0.79
Fe-59(GL)	10.8 ± 1.4 (± 12 %)	10.85 ± 0.22 (± 2.0 %)	-0.4	-0.06	-0.07
K-40	15.0 ± 1.8 (± 12 %)	16.9 ± 1.6 (± 10 %)	-11.0	-1.52	-1.89
Na-22	11.27 ± 0.36 (± 3.2 %)	11.74 ± 0.26 (± 2.2 %)	-4.0	-2.15	-0.69
Nb-95	12.2 ± 1.6 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	-5.6	-0.85	-0.95
Pb-210	18.3 ± 2.6 (± 14 %)	15.31 ± 0.34 (± 2.2 %)	19.5	2.35	3.35
Zr-95	5.6 ± 0.8 (± 14 %)	5.88 ± 0.10 (± 1.6 %)	-5.6	-0.86	-0.96



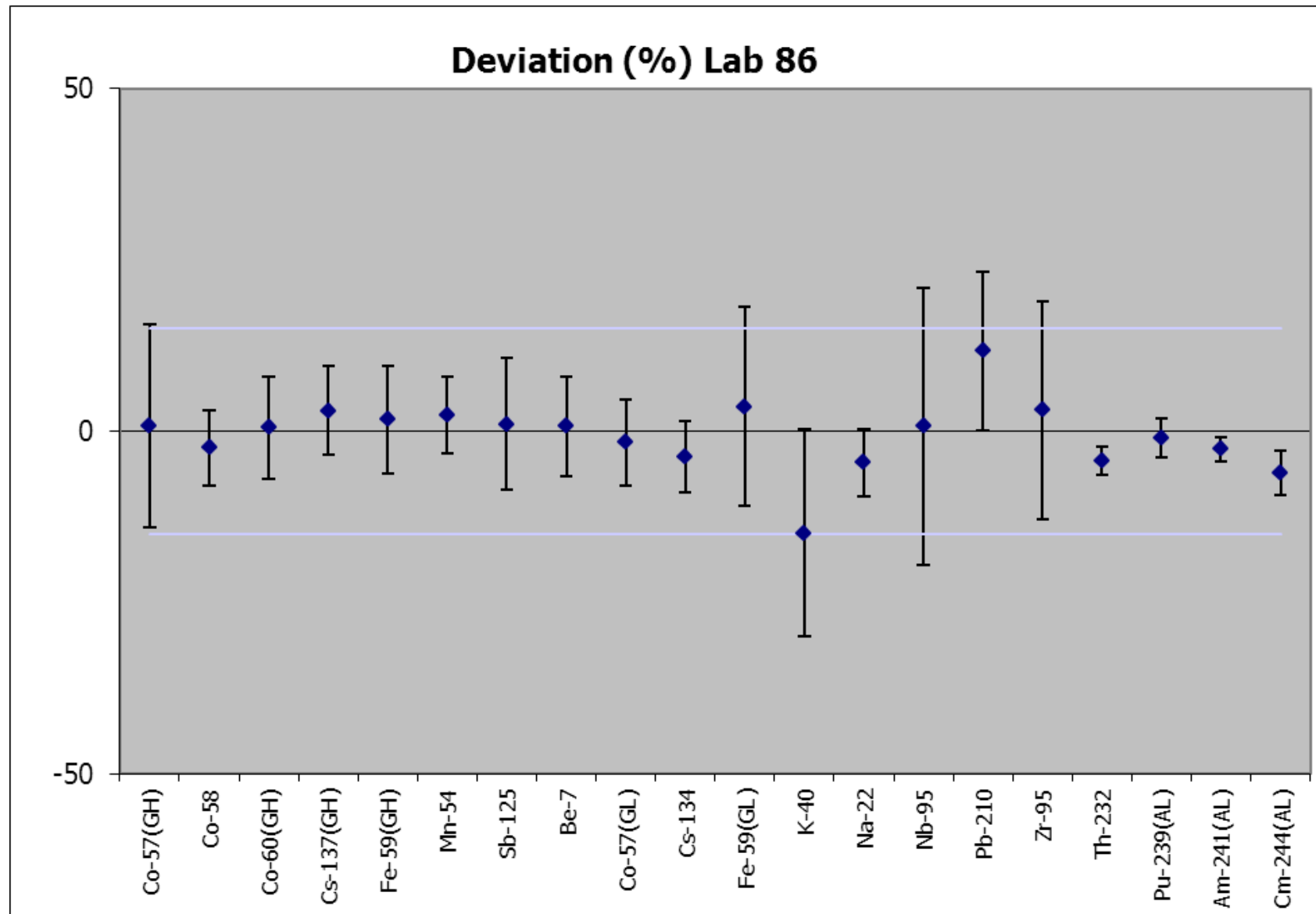
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Nuclide	Lab 82	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.84 ± 0.18 (± 22 %)	0.814 ± 0.022 (± 2.8 %)	3.2	0.29	0.56
Co-58	18.4 ± 3.8 (± 20 %)	18.54 ± 0.28 (± 1.6 %)	-0.8	-0.08	-0.13
Co-60(GH)	19.1 ± 3.8 (± 20 %)	18.73 ± 0.08 (± 0.42 %)	2.0	0.20	0.34
Cs-137(GH)	7.4 ± 1.6 (± 20 %)	7.15 ± 0.14 (± 2.0 %)	2.9	0.28	0.49
Fe-59(GH)	15.4 ± 3.2 (± 20 %)	15.07 ± 0.12 (± 0.8 %)	2.2	0.20	0.37
Mn-54	15 ± 3 (± 20 %)	14.88 ± 0.12 (± 0.8 %)	0.8	0.08	0.14
Sb-125	2.34 ± 0.48 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	1.9	0.18	0.32
Be-7	18.7 ± 4.4 (± 24 %)	17.7 ± 0.6 (± 3.4 %)	5.5	0.44	0.94
Co-57(GL)	2.8 ± 0.6 (± 22 %)	2.352 ± 0.032 (± 1.4 %)	18.6	1.46	3.20
Cs-134	6.9 ± 1.4 (± 20 %)	6.28 ± 0.20 (± 3 %)	9.7	0.86	1.67
Fe-59(GL)	11.9 ± 2.4 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	9.7	0.87	1.66
K-40	13.0 ± 2.6 (± 20 %)	16.9 ± 1.6 (± 10 %)	-22.9	-2.54	-3.92
Na-22	13.0 ± 2.6 (± 20 %)	11.74 ± 0.26 (± 2.2 %)	10.7	0.96	1.84
Nb-95	13.8 ± 3.2 (± 24 %)	12.96 ± 0.22 (± 1.8 %)	6.5	0.52	1.11
Zr-95	6.6 ± 1.4 (± 20 %)	5.88 ± 0.10 (± 1.6 %)	11.9	1.03	2.05



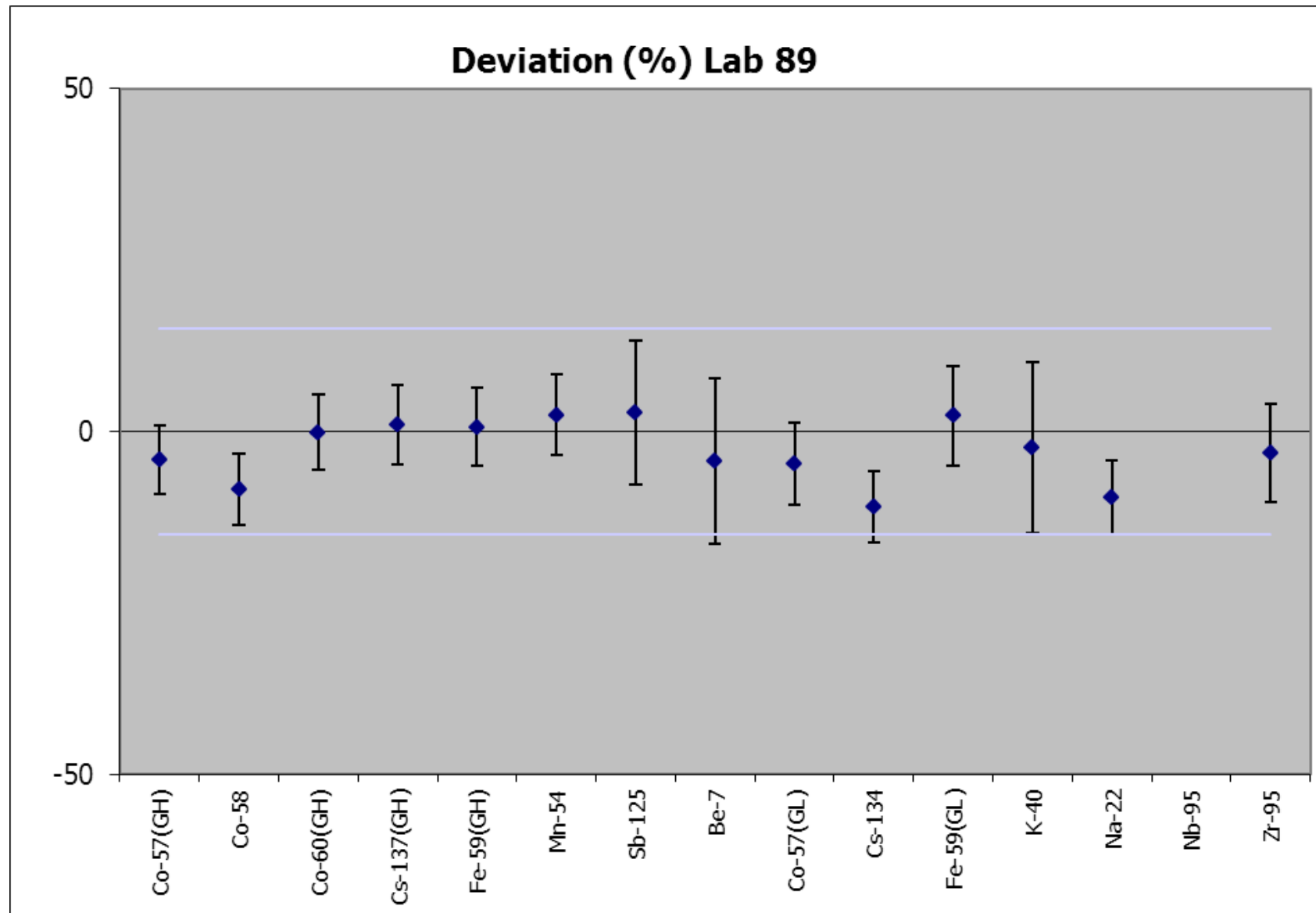
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Nuclide	Lab 83	Assigned Value	deviation	zeta	z score
Co-60(S)	9.10 ± 0.40 ($\pm 4.4 \%$)	9.1 ± 0.8 ($\pm 8 \%$)	-0.4	-0.09	-0.07
Cs-137(S)	9.3 ± 0.6 ($\pm 8 \%$)	9.5 ± 0.8 ($\pm 8 \%$)	-1.8	-0.37	-0.31
Co-60(GH)	20.6 ± 1.2 ($\pm 6 \%$)	18.73 ± 0.08 ($\pm 0.42 \%$)	10.1	3.39	1.73
Cs-137(GH)	7.95 ± 0.48 ($\pm 6 \%$)	7.15 ± 0.14 ($\pm 2.0 \%$)	11.1	3.19	1.91
Cs-134	5.9 ± 0.8 ($\pm 14 \%$)	6.28 ± 0.20 ($\pm 3 \%$)	-5.6	-0.83	-0.97
Tc-99	1.19 ± 0.12 ($\pm 10 \%$)	1.633 ± 0.008 ($\pm 0.44 \%$)	-27.1	-7.36	-4.66



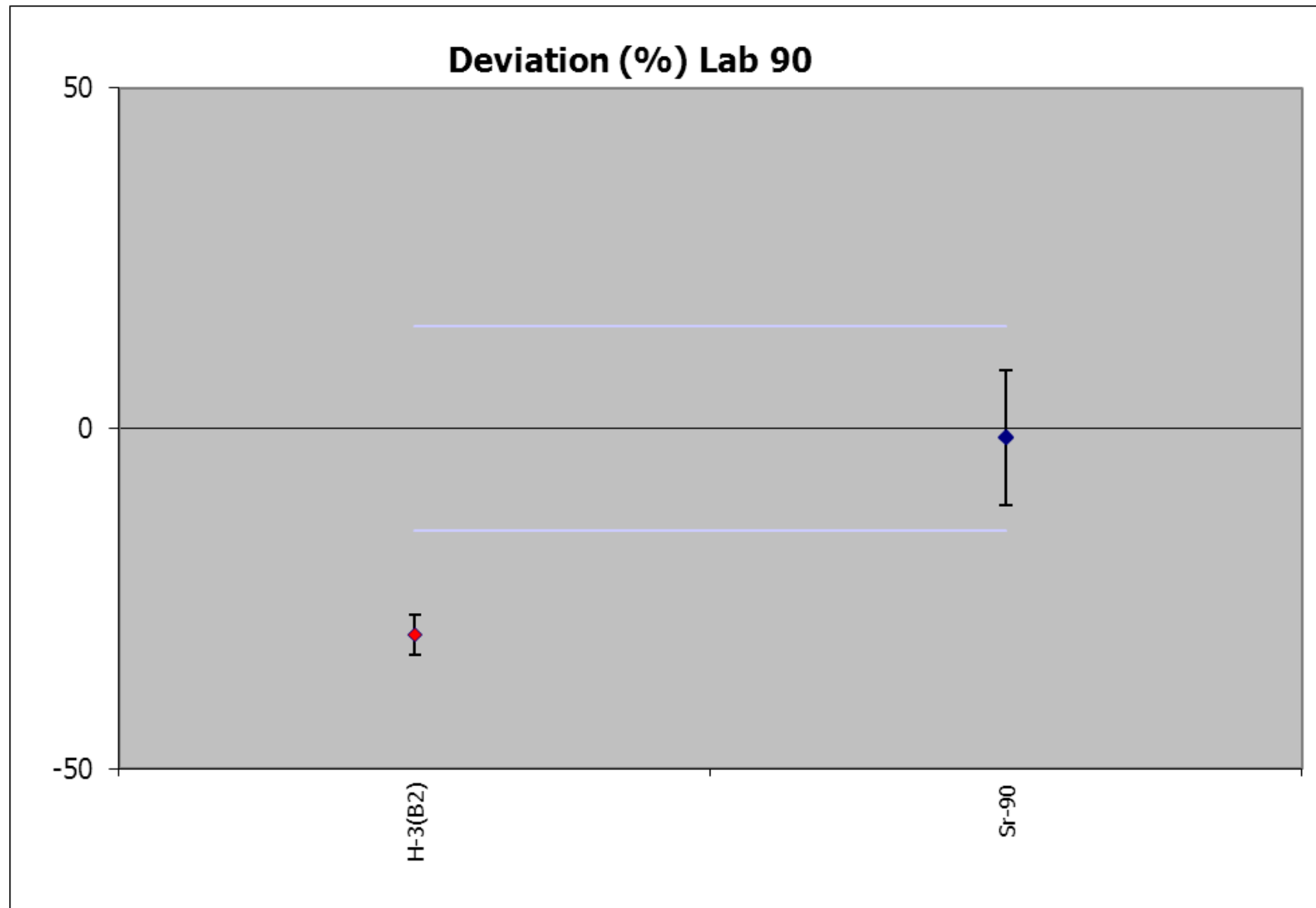
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Nuclide	Lab 86	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.82 ± 0.24 (± 30 %)	0.814 ± 0.022 (± 2.8 %)	0.8	0.05	0.14
Co-58	18.1 ± 2.0 (± 12 %)	18.54 ± 0.28 (± 1.6 %)	-2.4	-0.44	-0.41
Co-60(GH)	18.8 ± 2.8 (± 16 %)	18.73 ± 0.08 (± 0.42 %)	0.6	0.07	0.10
Cs-137(GH)	7.4 ± 1.0 (± 12 %)	7.15 ± 0.14 (± 2.0 %)	3.0	0.46	0.52
Fe-59(GH)	15.3 ± 2.4 (± 16 %)	15.07 ± 0.12 (± 0.8 %)	1.7	0.22	0.29
Mn-54	15.2 ± 1.6 (± 12 %)	14.88 ± 0.12 (± 0.8 %)	2.4	0.42	0.41
Sb-125	2.32 ± 0.44 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	1.0	0.11	0.17
Be-7	17.8 ± 2.4 (± 14 %)	17.7 ± 0.6 (± 3.4 %)	0.7	0.10	0.12
Co-57(GL)	2.31 ± 0.30 (± 14 %)	2.352 ± 0.032 (± 1.4 %)	-1.6	-0.26	-0.28
Cs-134	6.0 ± 0.6 (± 10 %)	6.28 ± 0.20 (± 3 %)	-3.7	-0.71	-0.64
Fe-59(GL)	11.2 ± 3.2 (± 28 %)	10.85 ± 0.22 (± 2.0 %)	3.6	0.25	0.62
K-40	14.4 ± 5.0 (± 34 %)	16.9 ± 1.6 (± 10 %)	-14.8	-0.97	-2.55
Na-22	11.2 ± 1.2 (± 10 %)	11.74 ± 0.26 (± 2.2 %)	-4.6	-0.93	-0.79
Nb-95	13 ± 6 (± 40 %)	12.96 ± 0.22 (± 1.8 %)	0.8	0.04	0.15
Pb-210	17.1 ± 3.6 (± 20 %)	15.31 ± 0.34 (± 2.2 %)	11.7	1.01	2.01
Zr-95	6.1 ± 1.8 (± 30 %)	5.88 ± 0.10 (± 1.6 %)	3.1	0.19	0.53
Th-232	3.60 ± 0.14 (± 3.8 %)	3.76 ± 0.08 (± 2.0 %)	-4.3	-2.06	-0.74
Pu-239(AL)	18.0 ± 1.0 (± 6 %)	18.18 ± 0.08 (± 0.38 %)	-1.0	-0.35	-0.17
Am-241(AL)	3.44 ± 0.12 (± 3.4 %)	3.532 ± 0.022 (± 0.6 %)	-2.6	-1.51	-0.45
Cm-244(AL)	10.3 ± 0.8 (± 8 %)	10.97 ± 0.08 (± 0.8 %)	-6.1	-1.86	-1.05



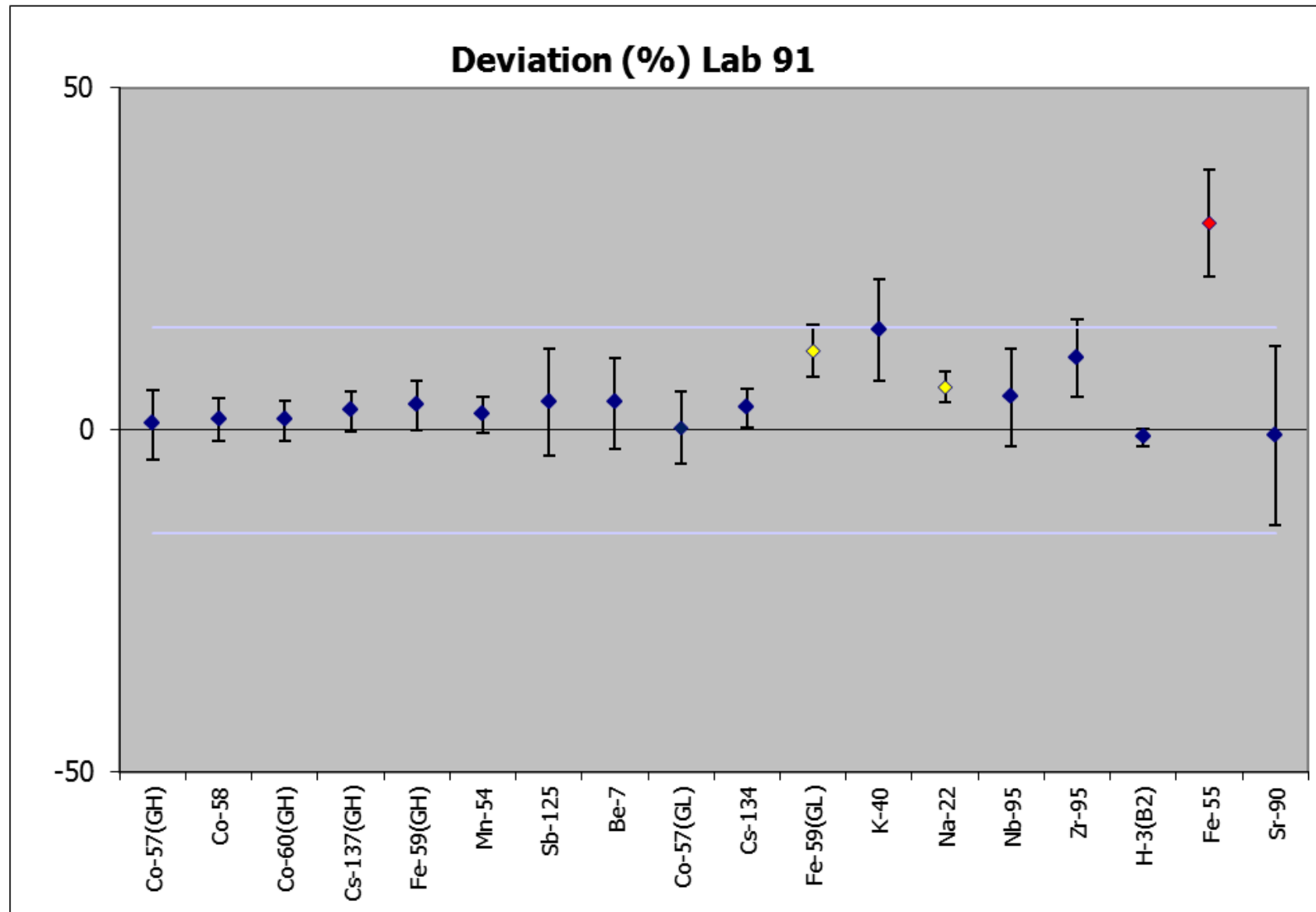
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Nuclide	Lab 89	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.78 ± 0.08 (± 10 %)	0.814 ± 0.022 (± 2.8 %)	-4.1	-0.81	-0.71
Co-58	17.0 ± 2.0 (± 12 %)	18.54 ± 0.28 (± 1.6 %)	-8.5	-1.64	-1.46
Co-60(GH)	18.7 ± 2.0 (± 12 %)	18.73 ± 0.08 (± 0.42 %)	-0.2	-0.03	-0.03
Cs-137(GH)	7.2 ± 0.8 (± 12 %)	7.15 ± 0.14 (± 2.0 %)	0.9	0.16	0.16
Fe-59(GH)	15.2 ± 1.8 (± 12 %)	15.07 ± 0.12 (± 0.8 %)	0.6	0.11	0.11
Mn-54	15.2 ± 1.8 (± 12 %)	14.88 ± 0.12 (± 0.8 %)	2.4	0.41	0.41
Sb-125	2.36 ± 0.48 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	2.8	0.26	0.47
Be-7	17.0 ± 4.2 (± 26 %)	17.7 ± 0.6 (± 3.4 %)	-4.4	-0.36	-0.75
Co-57(GL)	2.24 ± 0.28 (± 12 %)	2.352 ± 0.032 (± 1.4 %)	-4.8	-0.79	-0.82
Cs-134	5.6 ± 0.8 (± 12 %)	6.28 ± 0.20 (± 3 %)	-11.0	-2.07	-1.89
Fe-59(GL)	11.1 ± 1.6 (± 14 %)	10.85 ± 0.22 (± 2.0 %)	2.3	0.32	0.39
K-40	16.4 ± 4.0 (± 24 %)	16.9 ± 1.6 (± 10 %)	-2.4	-0.19	-0.41
Na-22	10.6 ± 1.2 (± 12 %)	11.74 ± 0.26 (± 2.2 %)	-9.6	-1.76	-1.66
Nb-95	22.8 ± 2.8 (± 12 %)	12.96 ± 0.22 (± 1.8 %)	75.5	7.02	12.97
Zr-95	5.7 ± 0.8 (± 16 %)	5.88 ± 0.10 (± 1.6 %)	-3.2	-0.45	-0.55



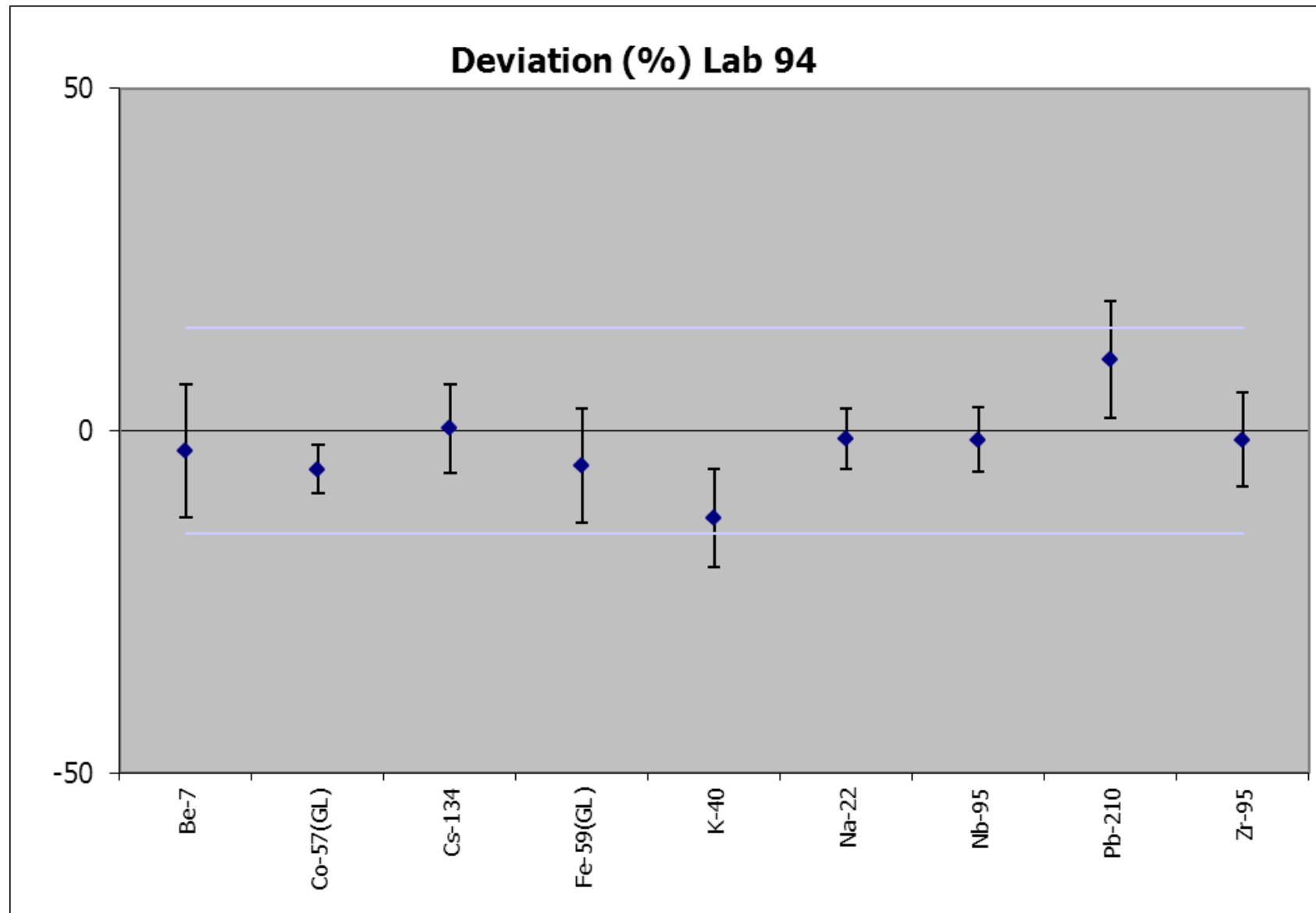
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Nuclide	Lab 90	Assigned Value	Deviation	zeta	z score
H-3(B2)	0.239 ± 0.020 (± 8 %)	0.3429 ± 0.0048 (± 1.4 %)	-30.3	-10.10	-5.20
Sr-90	1.59 ± 0.32 (± 20 %)	1.613 ± 0.008 (± 0.42 %)	-1.4	-0.14	-0.24



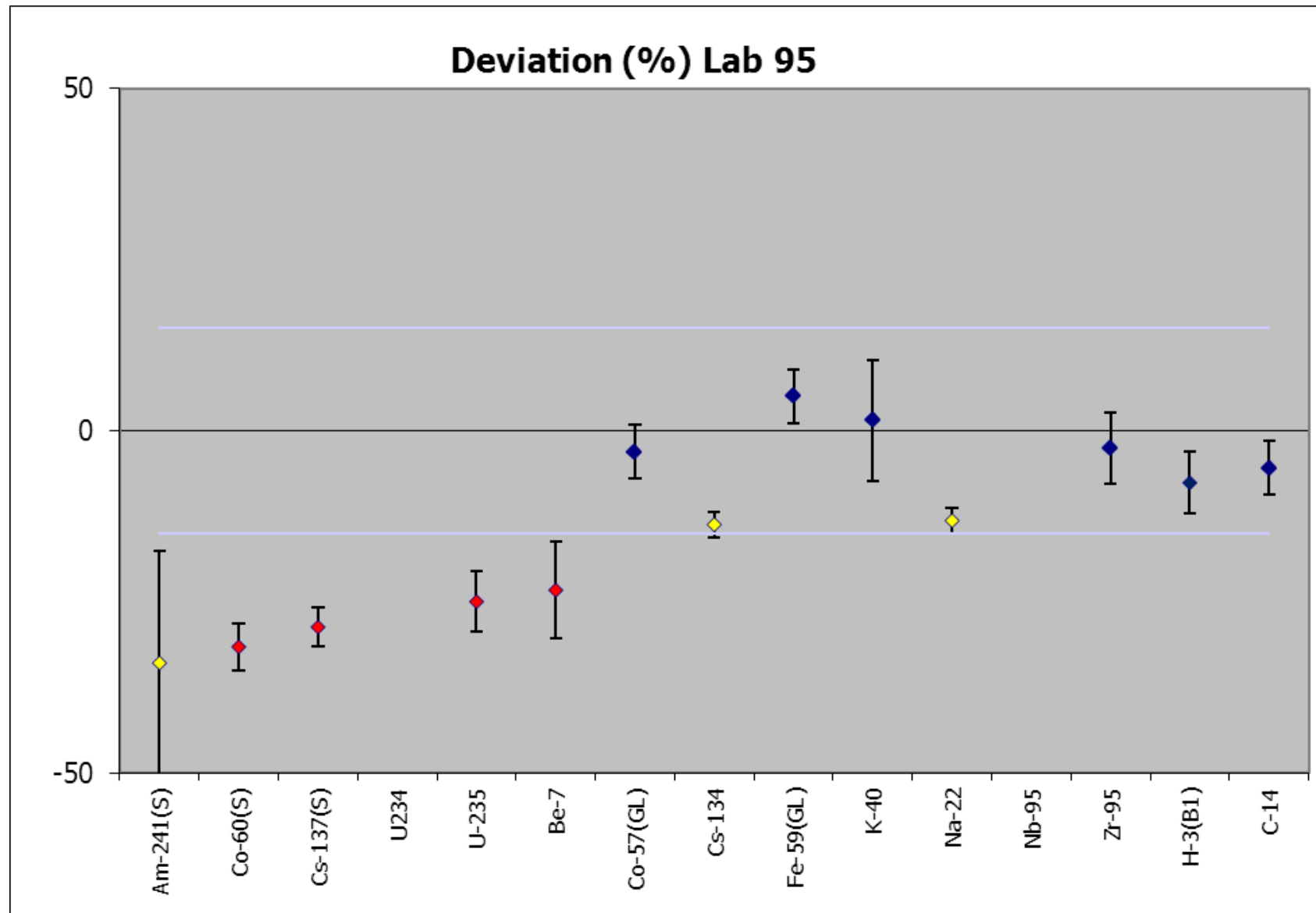
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Nuclide	Lab 91	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.82 ± 0.08 (± 10 %)	0.814 ± 0.022 (± 2.8 %)	0.8	0.16	0.14
Co-58	18.8 ± 1.2 (± 6 %)	18.54 ± 0.28 (± 1.6 %)	1.5	0.49	0.26
Co-60(GH)	19.0 ± 1.2 (± 6 %)	18.73 ± 0.08 (± 0.42 %)	1.4	0.48	0.24
Cs-137(GH)	7.35 ± 0.38 (± 6 %)	7.15 ± 0.14 (± 2.0 %)	2.7	0.96	0.47
Fe-59(GH)	15.6 ± 1.2 (± 8 %)	15.07 ± 0.12 (± 0.8 %)	3.6	1.01	0.62
Mn-54	15.2 ± 0.8 (± 5 %)	14.88 ± 0.12 (± 0.8 %)	2.2	0.87	0.39
Sb-125	2.39 ± 0.36 (± 16 %)	2.297 ± 0.022 (± 1.0 %)	4.1	0.52	0.70
Be-7	18.4 ± 2.2 (± 12 %)	17.7 ± 0.6 (± 3.4 %)	3.9	0.59	0.67
Co-57(GL)	2.36 ± 0.24 (± 10 %)	2.352 ± 0.032 (± 1.4 %)	0.3	0.06	0.06
Cs-134	6.48 ± 0.28 (± 4.4 %)	6.28 ± 0.20 (± 3 %)	3.2	1.16	0.55
Fe-59(GL)	12.1 ± 0.8 (± 8 %)	10.85 ± 0.22 (± 2.0 %)	11.6	3.11	1.99
K-40	19.3 ± 1.8 (± 10 %)	16.9 ± 1.6 (± 10 %)	14.6	2.11	2.51
Na-22	12.48 ± 0.46 (± 3.6 %)	11.74 ± 0.26 (± 2.2 %)	6.3	2.82	1.08
Nb-95	13.6 ± 1.8 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	4.8	0.68	0.82
Zr-95	6.5 ± 0.6 (± 8 %)	5.88 ± 0.34 (± 6 %)	10.5	1.94	1.81
H-3(B2)	0.339 ± 0.008 (± 2.2 %)	0.3429 ± 0.0048 (± 1.4 %)	-1.0	-0.81	-0.18
Fe-55	1.90 ± 0.22 (± 12 %)	1.46 ± 0.06 (± 3.6 %)	30.3	3.91	5.20
Sr-90	1.60 ± 0.42 (± 26 %)	1.613 ± 0.008 (± 0.42 %)	-0.8	-0.06	-0.14



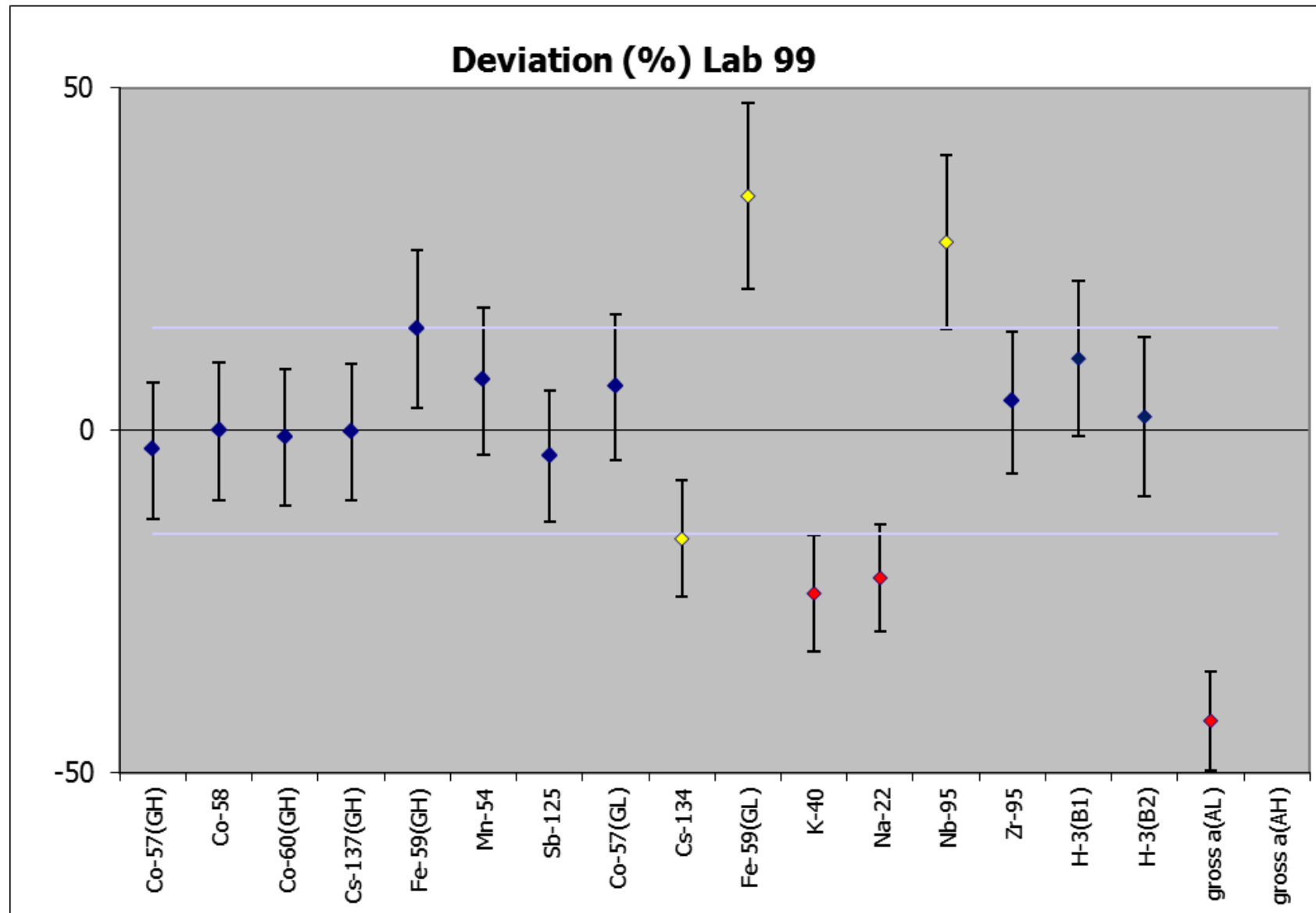
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Nuclide	Lab 94	Assigned Value	Deviation	zeta	z score
Be-7	17.2 ± 3.4 (± 20 %)	17.7 ± 0.6 (± 3.4 %)	-3.0	-0.31	-0.51
Co-57(GL)	2.22 ± 0.16 (± 8 %)	2.352 ± 0.032 (± 1.4 %)	-5.6	-1.62	-0.96
Cs-134	6.3 ± 0.8 (± 14 %)	6.28 ± 0.20 (± 3 %)	0.3	0.05	0.05
Fe-59(GL)	10.3 ± 1.8 (± 18 %)	10.85 ± 0.22 (± 2.0 %)	-5.1	-0.61	-0.87
K-40	14.7 ± 2.0 (± 14 %)	16.9 ± 1.6 (± 10 %)	-12.8	-1.70	-2.19
Na-22	11.6 ± 1.0 (± 10 %)	11.74 ± 0.26 (± 2.2 %)	-1.2	-0.28	-0.21
Nb-95	12.8 ± 1.2 (± 10 %)	12.96 ± 0.22 (± 1.8 %)	-1.2	-0.26	-0.21
Pb-210	16.9 ± 2.6 (± 16 %)	15.31 ± 0.34 (± 2.2 %)	10.4	1.21	1.78
Zr-95	5.8 ± 0.8 (± 14 %)	5.88 ± 0.10 (± 1.6 %)	-1.3	-0.20	-0.23



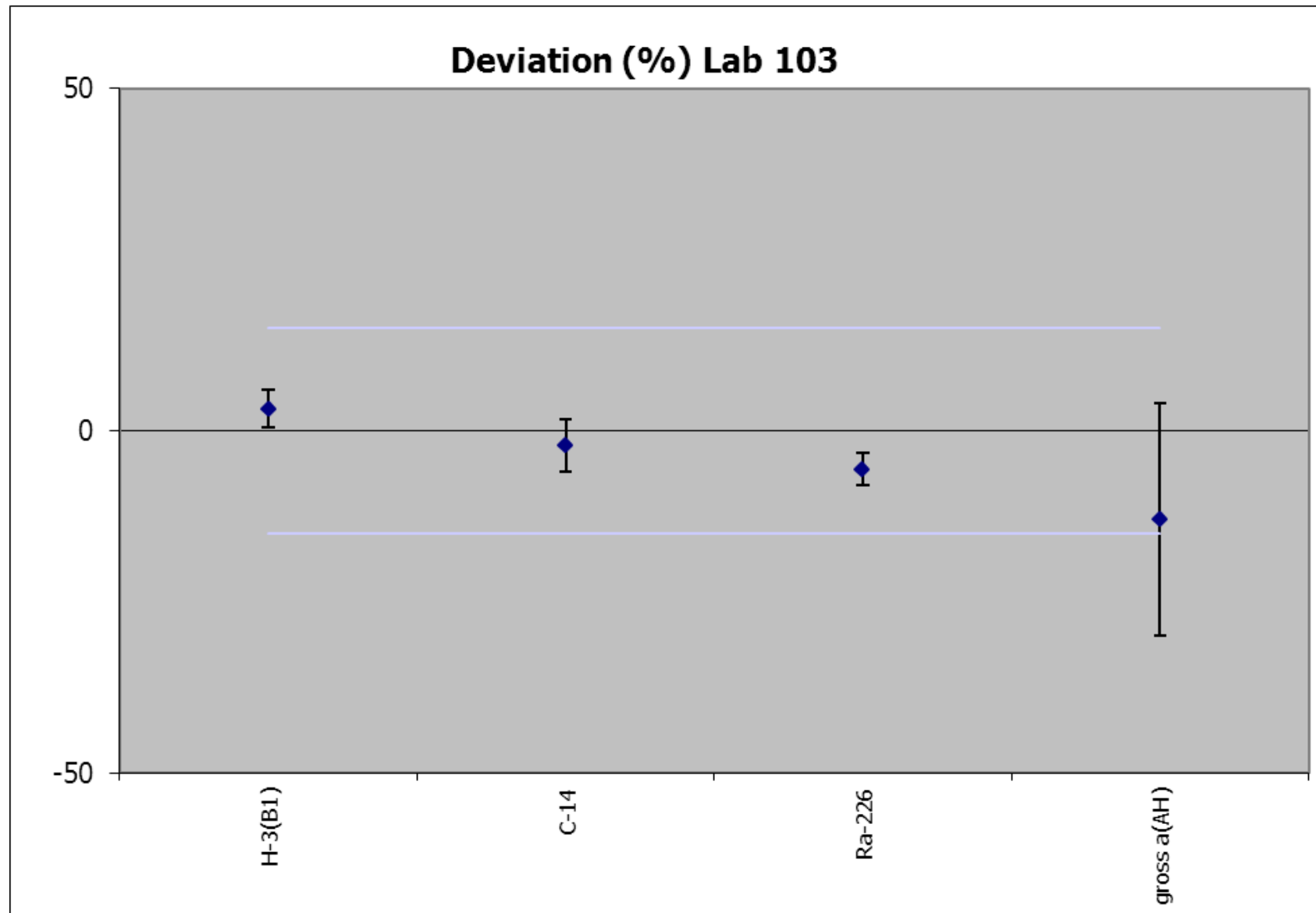
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Nuclide	Lab 95	Assigned Value	Deviation	zeta	z score
Am-241(S)	4.5 ± 2.2 (± 48 %)	6.8 ± 0.8 (± 10 %)	-33.9	-2.04	-5.82
Co-60(S)	6.27 ± 0.34 (± 6 %)	9.1 ± 0.8 (± 8 %)	-31.4	-7.19	-5.39
Cs-137(S)	6.75 ± 0.18 (± 2.8 %)	9.5 ± 0.8 (± 8 %)	-28.7	-7.67	-4.93
U-234	30 ± 22 (± 80 %)	7.8 ± 1.0 (± 12 %)	281.3	2.05	48.31
U-235	0.276 ± 0.008 (± 2.6 %)	0.368 ± 0.030 (± 8 %)	-25.0	-6.09	-4.29
Be-7	13.6 ± 2.4 (± 18 %)	17.7 ± 0.6 (± 3.4 %)	-23.3	-3.29	-4.00
Co-57(GL)	2.28 ± 0.18 (± 8 %)	2.352 ± 0.032 (± 1.4 %)	-3.1	-0.79	-0.53
Cs-134	5.42 ± 0.16 (± 3 %)	6.28 ± 0.20 (± 3 %)	-13.7	-6.93	-2.35
Fe-59(GL)	11.4 ± 0.8 (± 8 %)	10.85 ± 0.22 (± 2.0 %)	5.1	1.29	0.87
K-40	17.1 ± 2.4 (± 14 %)	16.9 ± 1.6 (± 10 %)	1.5	0.17	0.25
Na-22	10.20 ± 0.38 (± 3.8 %)	11.74 ± 0.26 (± 2.2 %)	-13.1	-6.78	-2.26
Nb-95	23.7 ± 2.0 (± 8 %)	12.96 ± 0.22 (± 1.8 %)	82.9	11.00	14.23
Zr-95	5.7 ± 0.6 (± 10 %)	5.88 ± 0.10 (± 1.6 %)	-2.5	-0.49	-0.43
H-3(B1)	1.38 ± 0.14 (± 10 %)	1.493 ± 0.020 (± 1.4 %)	-7.6	-1.69	-1.30
C-14	0.76 ± 0.06 (± 8 %)	0.807 ± 0.014 (± 1.6 %)	-5.5	-1.39	-0.94



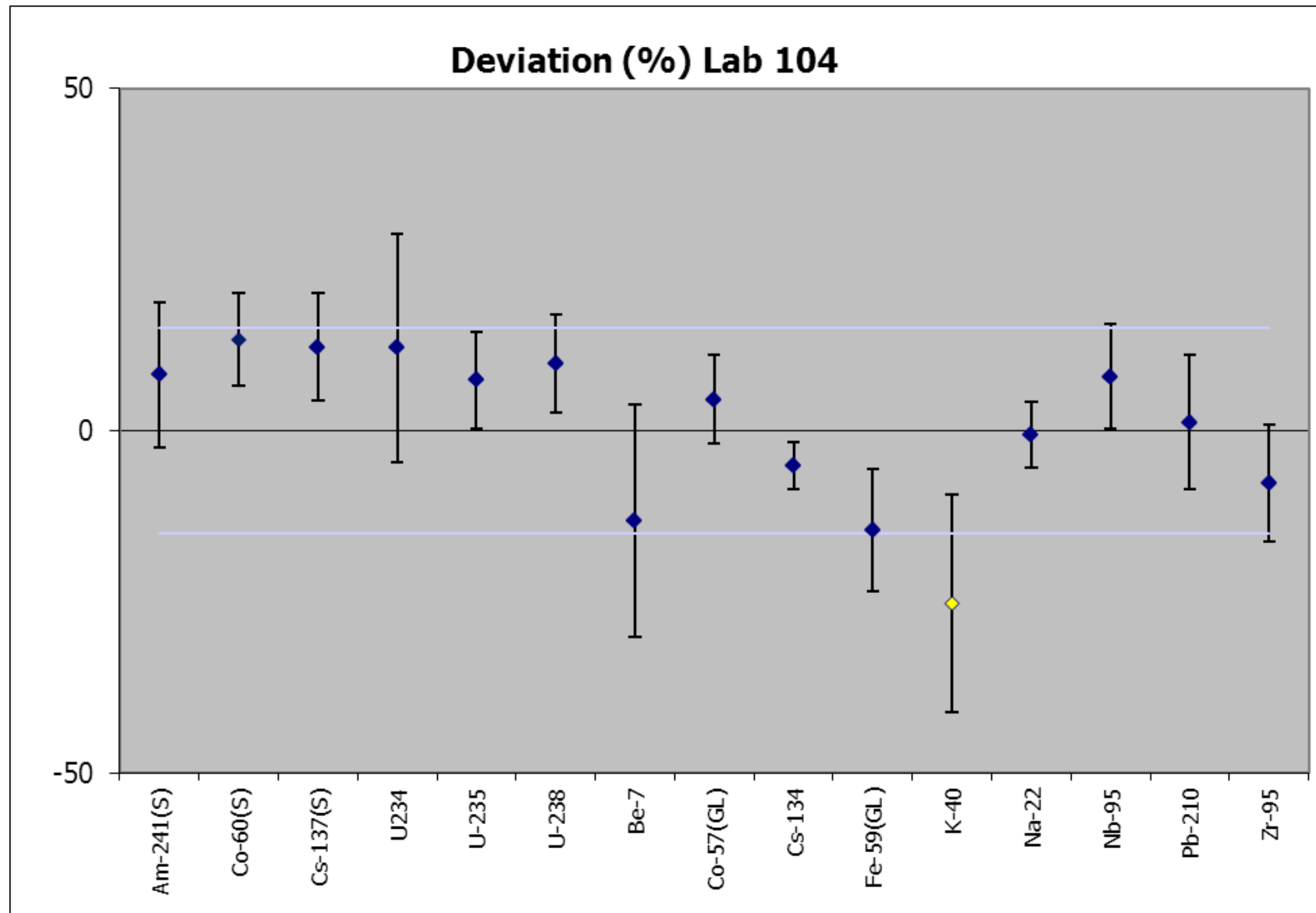
NPL Report IR 27

Nuclide	Lab 99	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.79 ± 0.16 (± 20 %)	0.814 ± 0.022 (± 2.8 %)	-2.9	-0.29	-0.50
Co-58	18.5 ± 3.6 (± 20 %)	18.54 ± 0.28 (± 1.6 %)	-0.1	-0.01	-0.01
Co-60(GH)	18.5 ± 3.6 (± 20 %)	18.73 ± 0.08 (± 0.42 %)	-1.0	-0.10	-0.17
Cs-137(GH)	7.1 ± 1.4 (± 20 %)	7.15 ± 0.14 (± 2.0 %)	-0.2	-0.02	-0.03
Fe-59(GH)	17.3 ± 3.4 (± 20 %)	15.07 ± 0.12 (± 0.8 %)	14.8	1.29	2.55
Mn-54	16.0 ± 3.2 (± 20 %)	14.88 ± 0.12 (± 0.8 %)	7.3	0.68	1.25
Sb-125	2.21 ± 0.44 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	-3.8	-0.39	-0.65
Co-57(GL)	2.5 ± 0.5 (± 20 %)	2.352 ± 0.032 (± 1.4 %)	6.3	0.59	1.08
Cs-134	5.3 ± 1.2 (± 20 %)	6.28 ± 0.20 (± 3 %)	-15.8	-1.84	-2.71
Fe-59(GL)	14.6 ± 3.0 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	34.3	2.54	5.89
K-40	12.8 ± 2.6 (± 20 %)	16.9 ± 1.6 (± 10 %)	-23.7	-2.66	-4.08
Na-22	9.2 ± 1.8 (± 20 %)	11.74 ± 0.26 (± 2.2 %)	-21.5	-2.72	-3.69
Nb-95	16.5 ± 3.2 (± 20 %)	12.96 ± 0.22 (± 1.8 %)	27.5	2.16	4.73
Zr-95	6.1 ± 1.2 (± 20 %)	5.88 ± 0.10 (± 1.6 %)	4.1	0.39	0.70
H-3(B1)	1.65 ± 0.34 (± 20 %)	1.493 ± 0.020 (± 1.4 %)	10.5	0.92	1.81
H-3(B2)	0.35 ± 0.08 (± 22 %)	0.3429 ± 0.0048 (± 1.4 %)	2.1	0.18	0.35
gross α (AL)	37 ± 8 (± 20 %)	65 ± 10 (± 16 %)	-42.3	-4.46	-7.27
gross α (AH)	13.7 ± 2.8 (± 20 %)	44 ± 12 (± 28 %)	-68.7	-4.65	-11.79



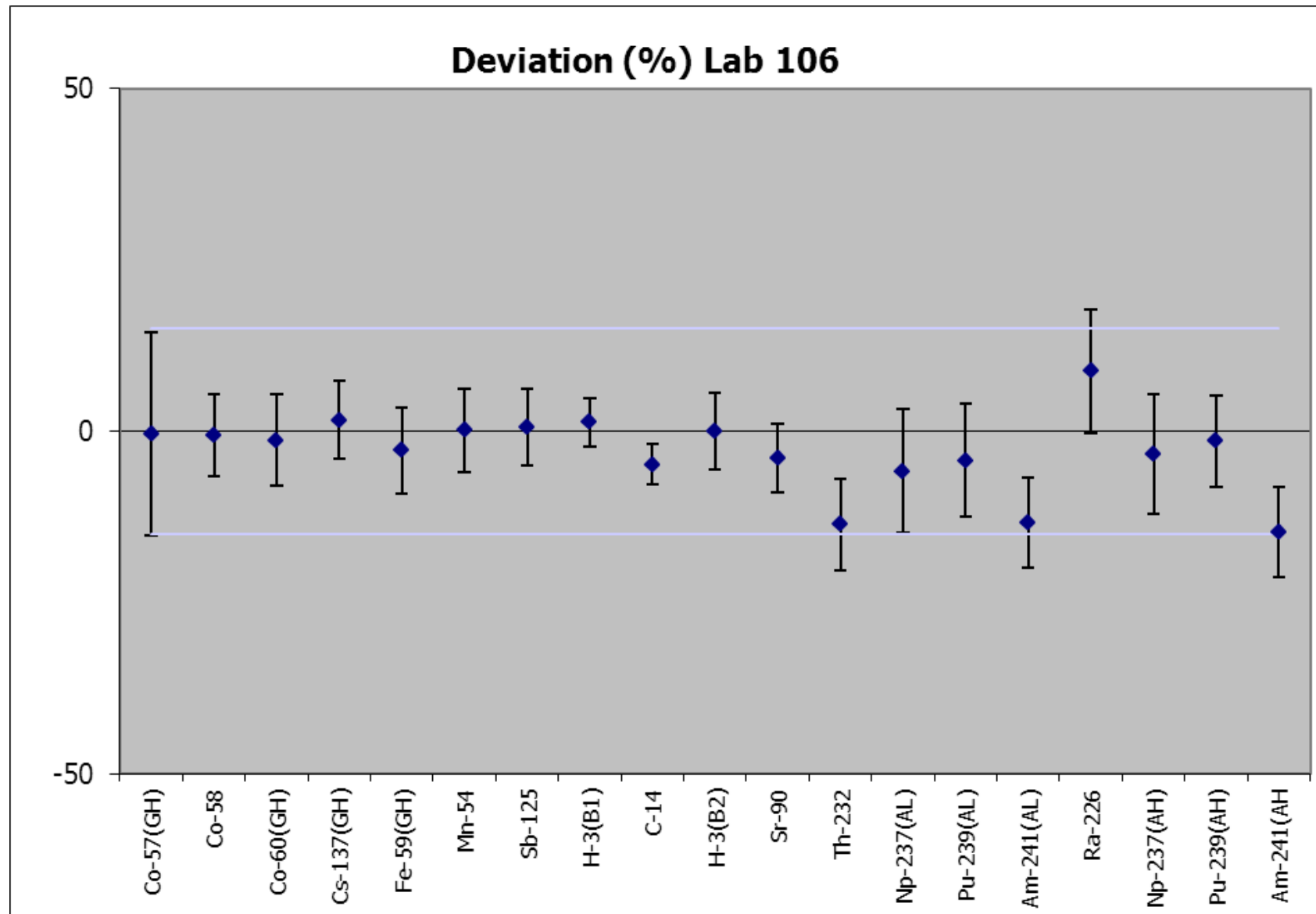
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Nuclide	Lab 103	Assigned Value	Deviation	zeta	z score
H-3(B1)	1.54 ± 0.08 (± 6 %)	1.493 ± 0.020 (± 1.4 %)	3.2	1.15	0.55
C-14	0.79 ± 0.06 (± 8 %)	0.807 ± 0.014 (± 1.6 %)	-2.1	-0.56	-0.37
Ra-226	3.60 ± 0.16 (± 4.4 %)	3.81 ± 0.10 (± 2.6 %)	-5.6	-2.27	-0.96
gross α (AH)	38 ± 10 (± 26 %)	44 ± 12 (± 28 %)	-12.9	-0.70	-2.22



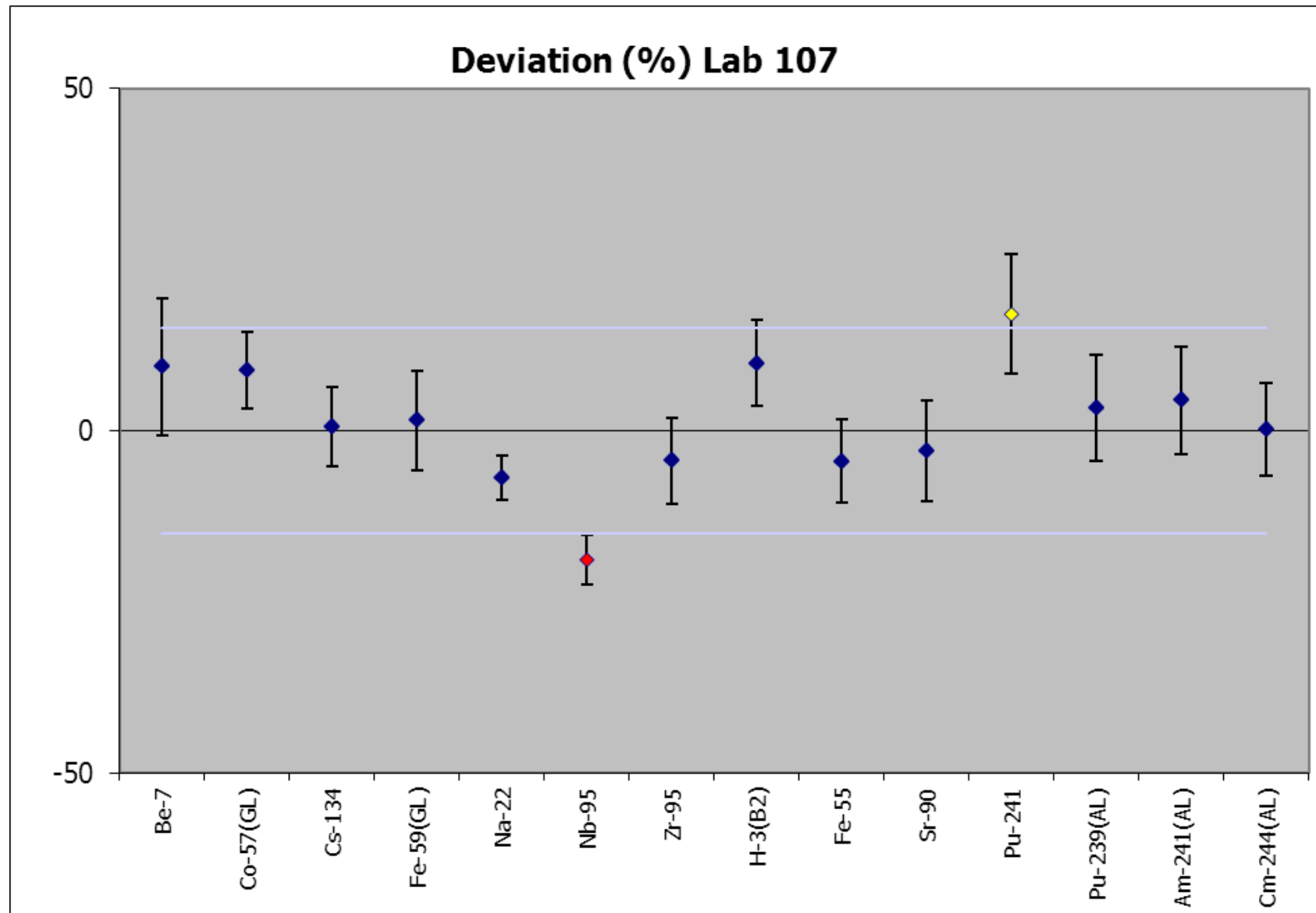
NPL Report IR 27

Nuclide	Lab 104	Assigned Value	Deviation	zeta	z score
Am-241(S)	7.4 ± 1.2 (± 16 %)	6.8 ± 0.8 (± 10 %)	8.2	0.84	1.40
Co-60(S)	10.4 ± 1.0 (± 10 %)	9.1 ± 0.8 (± 8 %)	13.6	2.16	2.34
Cs-137(S)	10.6 ± 1.2 (± 12 %)	9.5 ± 0.8 (± 8 %)	12.2	1.61	2.09
U-234	8.7 ± 2.4 (± 28 %)	7.8 ± 1.0 (± 12 %)	11.7	0.72	2.01
U-235	0.395 ± 0.026 (± 8 %)	0.368 ± 0.030 (± 8 %)	7.4	1.38	1.26
U-238	8.6 ± 0.8 (± 10 %)	7.9 ± 1.0 (± 12 %)	8.7	1.18	1.49
Be-7	15 ± 6 (± 38 %)	17.7 ± 0.6 (± 3.4 %)	-13.1	-0.77	-2.26
Co-57(GL)	2.46 ± 0.30 (± 12 %)	2.352 ± 0.032 (± 1.4 %)	4.6	0.72	0.79
Cs-134	5.96 ± 0.40 (± 8 %)	6.28 ± 0.20 (± 3 %)	-5.1	-1.45	-0.88
Fe-59(GL)	9.3 ± 2.0 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	-14.5	-1.63	-2.49
K-40	13 ± 6 (± 42 %)	16.9 ± 1.6 (± 10 %)	-25.2	-1.57	-4.33
Na-22	11.7 ± 1.2 (± 10 %)	11.74 ± 0.26 (± 2.2 %)	-0.6	-0.13	-0.11
Nb-95	14.0 ± 2.0 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	8.0	1.04	1.38
Pb-210	15.5 ± 3.0 (± 20 %)	15.31 ± 0.34 (± 2.2 %)	1.2	0.12	0.21
Zr-95	5.4 ± 1.0 (± 18 %)	5.88 ± 0.10 (± 1.6 %)	-7.6	-0.89	-1.31



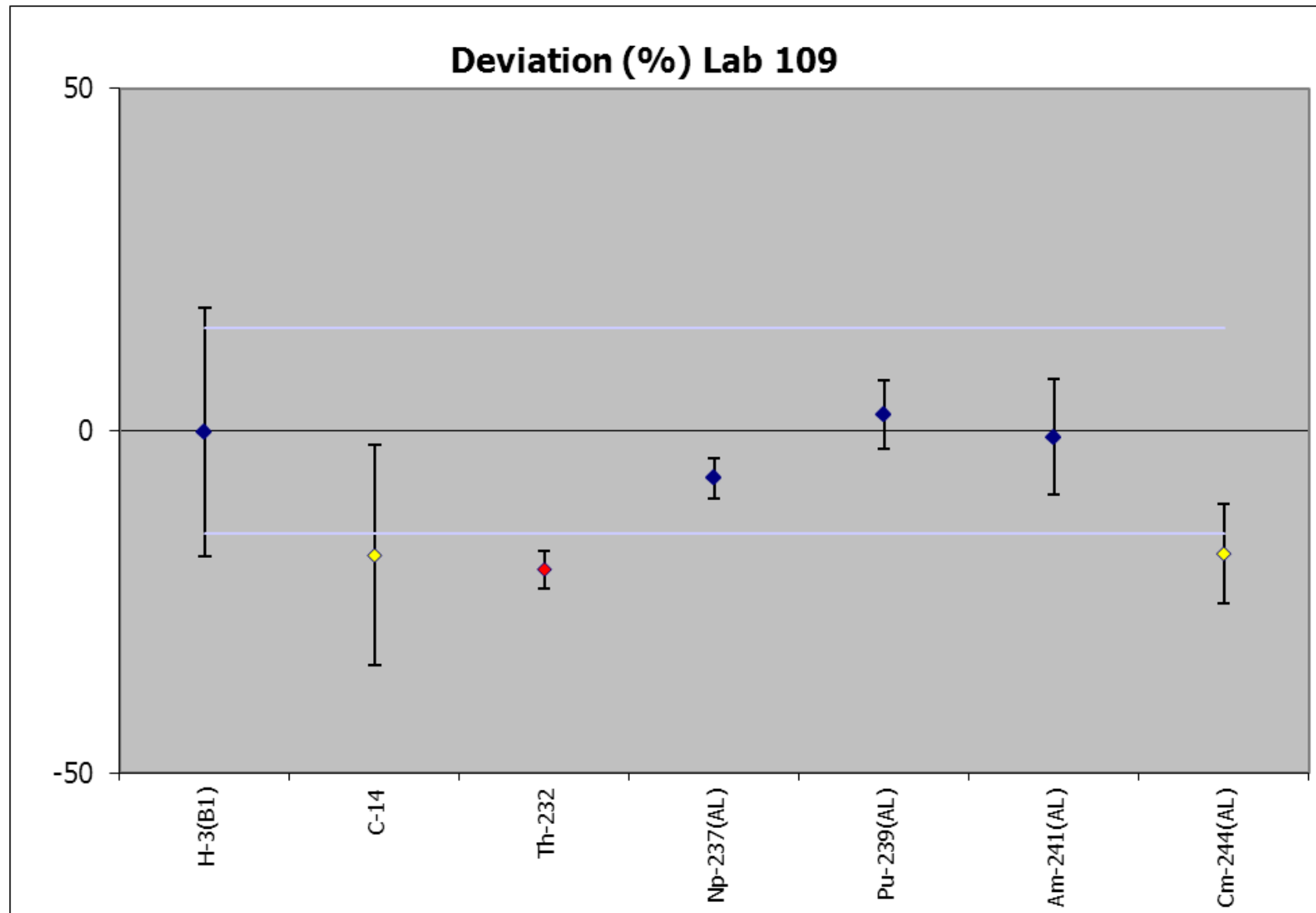
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Nuclide	Lab 106	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.81 ± 0.24 (± 30 %)	0.814 ± 0.022 (± 2.8 %)	-0.4	-0.03	-0.08
Co-58	18.4 ± 2.2 (± 12 %)	18.54 ± 0.28 (± 1.6 %)	-0.6	-0.09	-0.10
Co-60(GH)	18.5 ± 2.4 (± 14 %)	18.73 ± 0.08 (± 0.42 %)	-1.4	-0.20	-0.23
Cs-137(GH)	7.3 ± 0.8 (± 12 %)	7.15 ± 0.14 (± 2.0 %)	1.6	0.28	0.28
Fe-59(GH)	14.6 ± 2.0 (± 14 %)	15.07 ± 0.12 (± 0.8 %)	-2.8	-0.45	-0.48
Mn-54	14.9 ± 1.8 (± 12 %)	14.88 ± 0.12 (± 0.8 %)	0.1	0.02	0.02
Sb-125	2.31 ± 0.26 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	0.6	0.10	0.10
H-3(B1)	1.51 ± 0.10 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	1.3	0.37	0.22
C-14	0.768 ± 0.046 (± 6 %)	0.807 ± 0.014 (± 1.6 %)	-4.9	-1.64	-0.83
H-3(B2)	0.343 ± 0.038 (± 12 %)	0.3429 ± 0.0048 (± 1.4 %)	0.0	0.00	0.00
Sr-90	1.55 ± 0.16 (± 10 %)	1.613 ± 0.008 (± 0.42 %)	-3.9	-0.79	-0.67
Th-232	3.25 ± 0.50 (± 16 %)	3.76 ± 0.08 (± 2.0 %)	-13.6	-2.03	-2.34
Np-237(AL)	16.9 ± 3.2 (± 18 %)	17.95 ± 0.36 (± 2.0 %)	-5.8	-0.65	-1.00
Pu-239(AL)	17.4 ± 3.0 (± 18 %)	18.18 ± 0.08 (± 0.38 %)	-4.2	-0.51	-0.73
Am-241(AL)	3.06 ± 0.46 (± 16 %)	3.532 ± 0.022 (± 0.6 %)	-13.4	-2.05	-2.30
Ra-226	4.2 ± 0.8 (± 16 %)	3.81 ± 0.10 (± 2.6 %)	8.8	0.98	1.51
Np-237(AH)	10.6 ± 1.8 (± 18 %)	10.94 ± 0.22 (± 2.0 %)	-3.3	-0.39	-0.57
Pu-239(AH)	6.0 ± 0.8 (± 14 %)	6.138 ± 0.026 (± 0.42 %)	-1.4	-0.21	-0.25
Am-241(AH)	3.23 ± 0.50 (± 16 %)	3.786 ± 0.016 (± 0.42 %)	-14.7	-2.22	-2.52



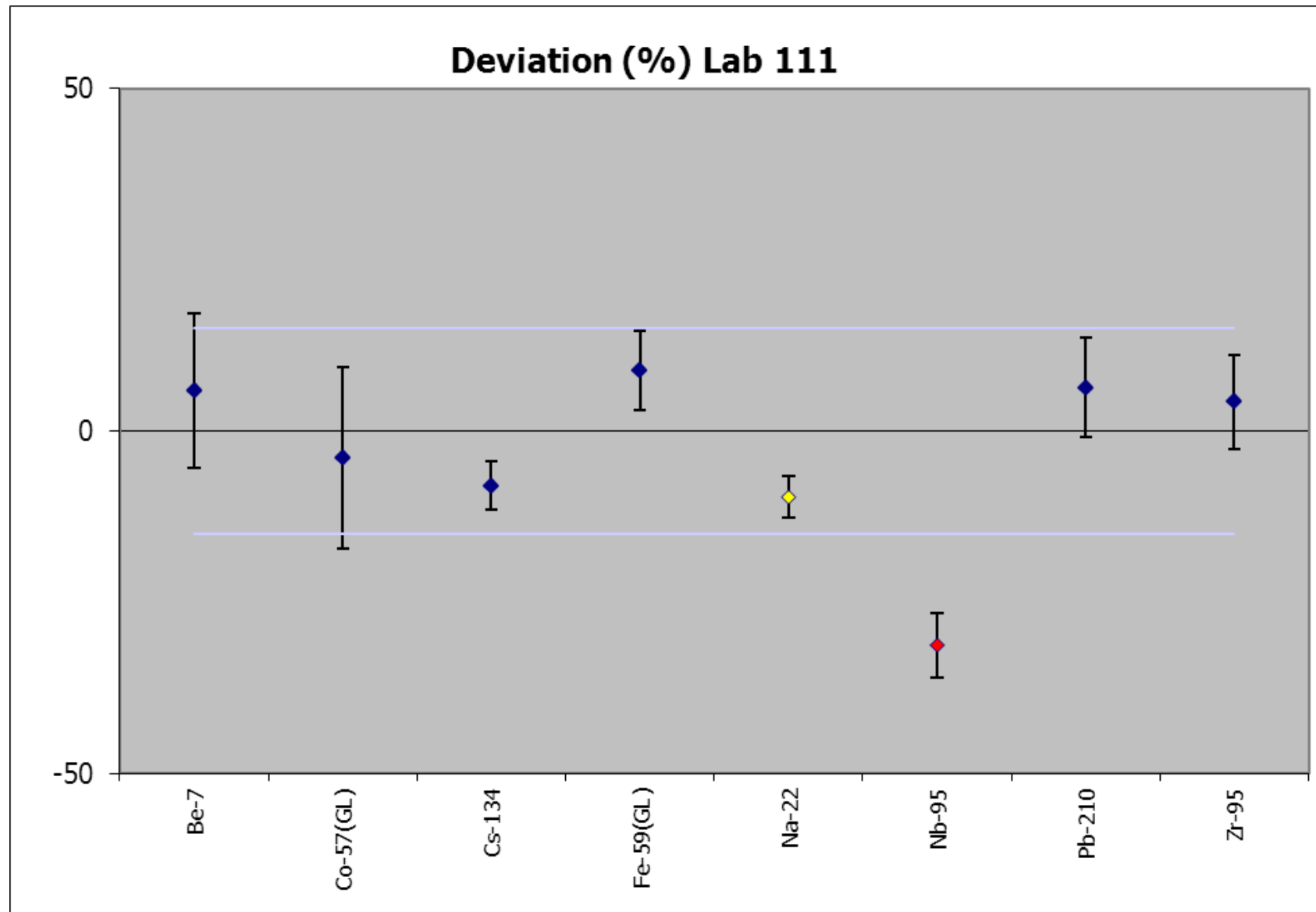
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Nuclide	Lab 107	Assigned Value	Deviation	zeta	z score
Be-7	19.4 ± 3.4 (± 18 %)	17.7 ± 0.6 (± 3.4 %)	9.3	0.94	1.60
Co-57(GL)	2.56 ± 0.26 (± 10 %)	2.352 ± 0.032 (± 1.4 %)	8.8	1.59	1.52
Cs-134	6.3 ± 0.8 (± 12 %)	6.28 ± 0.20 (± 3 %)	0.6	0.11	0.11
Fe-59(GL)	11.0 ± 1.6 (± 14 %)	10.85 ± 0.22 (± 2.0 %)	1.6	0.21	0.27
Na-22	10.9 ± 0.8 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-6.8	-2.10	-1.17
Nb-95	10.5 ± 1.0 (± 10 %)	12.96 ± 0.22 (± 1.8 %)	-18.8	-5.13	-3.22
Zr-95	5.6 ± 0.8 (± 14 %)	5.88 ± 0.10 (± 1.6 %)	-4.4	-0.69	-0.76
H-3(B2)	0.377 ± 0.042 (± 12 %)	0.3429 ± 0.0048 (± 1.4 %)	9.9	1.57	1.70
Fe-55	1.39 ± 0.18 (± 12 %)	1.46 ± 0.06 (± 3.6 %)	-4.4	-0.72	-0.76
Sr-90	1.57 ± 0.24 (± 16 %)	1.613 ± 0.008 (± 0.42 %)	-2.9	-0.40	-0.50
Pu-241	0.94 ± 0.14 (± 16 %)	0.799 ± 0.018 (± 2.2 %)	17.0	1.95	2.92
Pu-239(AL)	18.8 ± 2.8 (± 16 %)	18.18 ± 0.08 (± 0.38 %)	3.2	0.42	0.56
Am-241(AL)	3.7 ± 0.6 (± 16 %)	3.532 ± 0.022 (± 0.6 %)	4.5	0.57	0.77
Cm-244(AL)	11.0 ± 1.6 (± 14 %)	10.97 ± 0.08 (± 0.8 %)	0.2	0.02	0.03



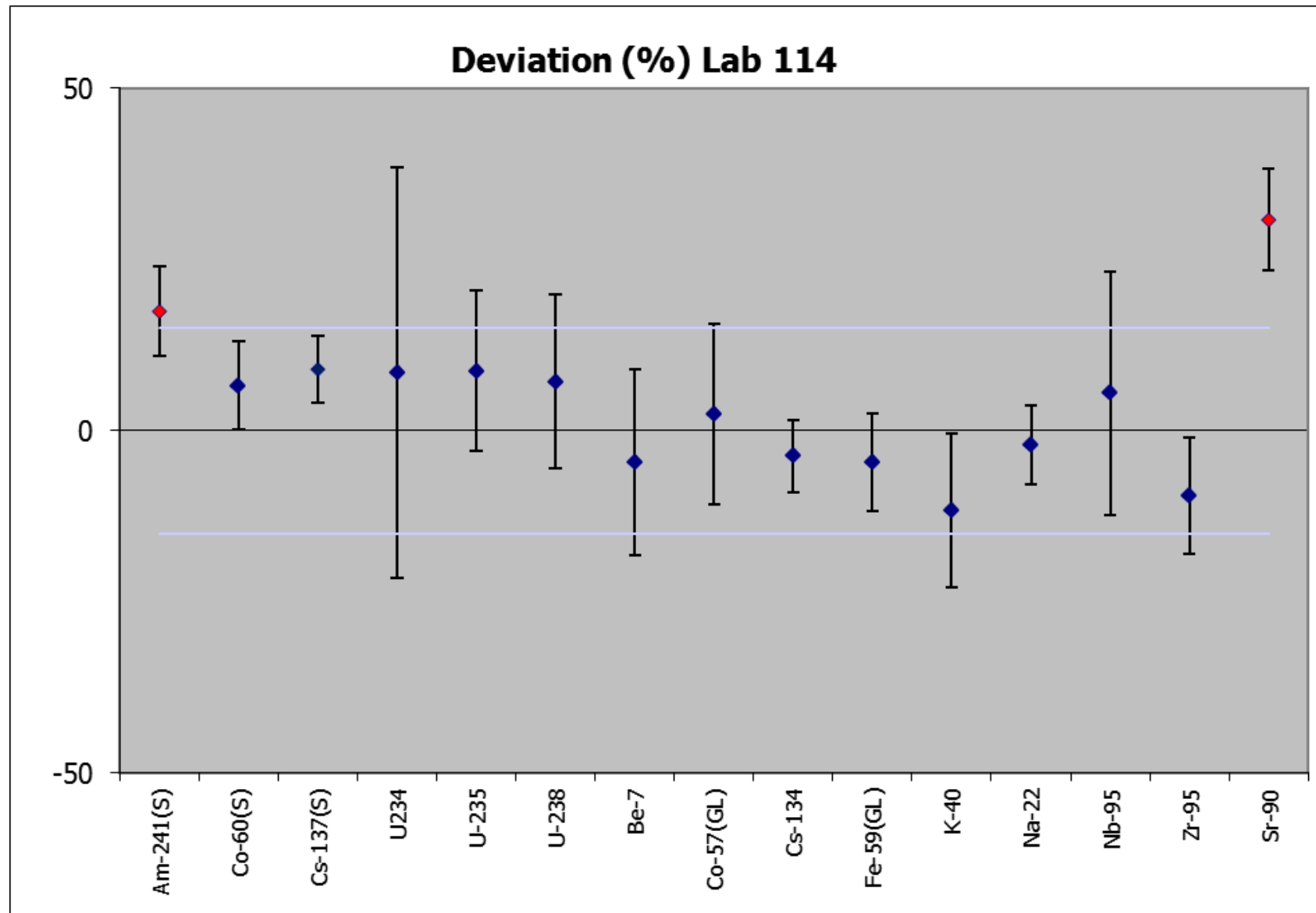
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Nuclide	Lab 109	Assigned Value	Deviation	zeta	z score
H-3(B1)	1.5 ± 0.6 (± 36 %)	1.493 ± 0.020 (± 1.4 %)	-0.2	-0.01	-0.03
C-14	0.66 ± 0.26 (± 40 %)	0.807 ± 0.014 (± 1.6 %)	-18.2	-1.13	-3.13
Th-232	3.00 ± 0.20 (± 8 %)	3.76 ± 0.08 (± 2.0 %)	-20.3	-7.17	-3.48
Np-237(AL)	16.7 ± 1.0 (± 6 %)	17.95 ± 0.36 (± 2.0 %)	-6.9	-2.35	-1.19
Pu-239(AL)	18.6 ± 1.8 (± 10 %)	18.18 ± 0.08 (± 0.38 %)	2.3	0.47	0.40
Am-241(AL)	3.5 ± 0.6 (± 18 %)	3.532 ± 0.022 (± 0.6 %)	-0.9	-0.11	-0.16
Cm-244(AL)	9.0 ± 1.6 (± 18 %)	10.97 ± 0.08 (± 0.8 %)	-18.0	-2.46	-3.09



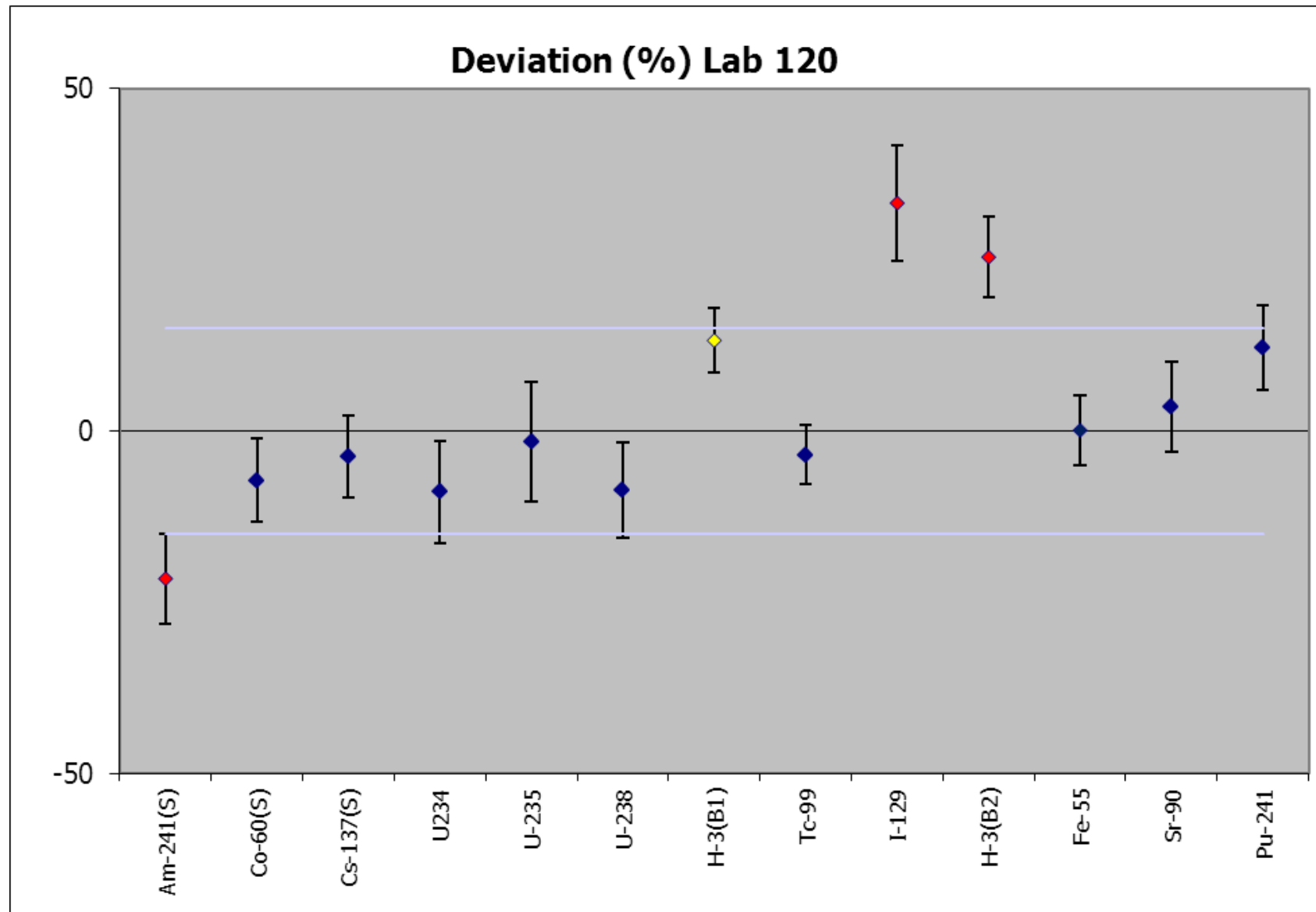
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Nuclide	Lab 111	Assigned Value	Deviation	zeta	z score
Be-7	18.8 ± 4.0 (± 22 %)	17.7 ± 0.6 (± 3.4 %)	5.9	0.52	1.01
Co-57(GL)	2.3 ± 0.6 (± 28 %)	2.352 ± 0.032 (± 1.4 %)	-3.9	-0.30	-0.67
Cs-134	5.78 ± 0.40 (± 8 %)	6.28 ± 0.20 (± 3 %)	-8.0	-2.26	-1.37
Fe-59(GL)	11.8 ± 1.2 (± 10 %)	10.85 ± 0.22 (± 2.0 %)	8.8	1.52	1.52
Na-22	10.6 ± 0.8 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-9.6	-3.12	-1.66
Nb-95	8.9 ± 1.2 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	-31.2	-6.51	-5.35
Pb-210	16.3 ± 2.2 (± 14 %)	15.31 ± 0.34 (± 2.2 %)	6.3	0.88	1.09
Zr-95	6.1 ± 0.8 (± 14 %)	5.88 ± 0.10 (± 1.6 %)	4.3	0.62	0.73



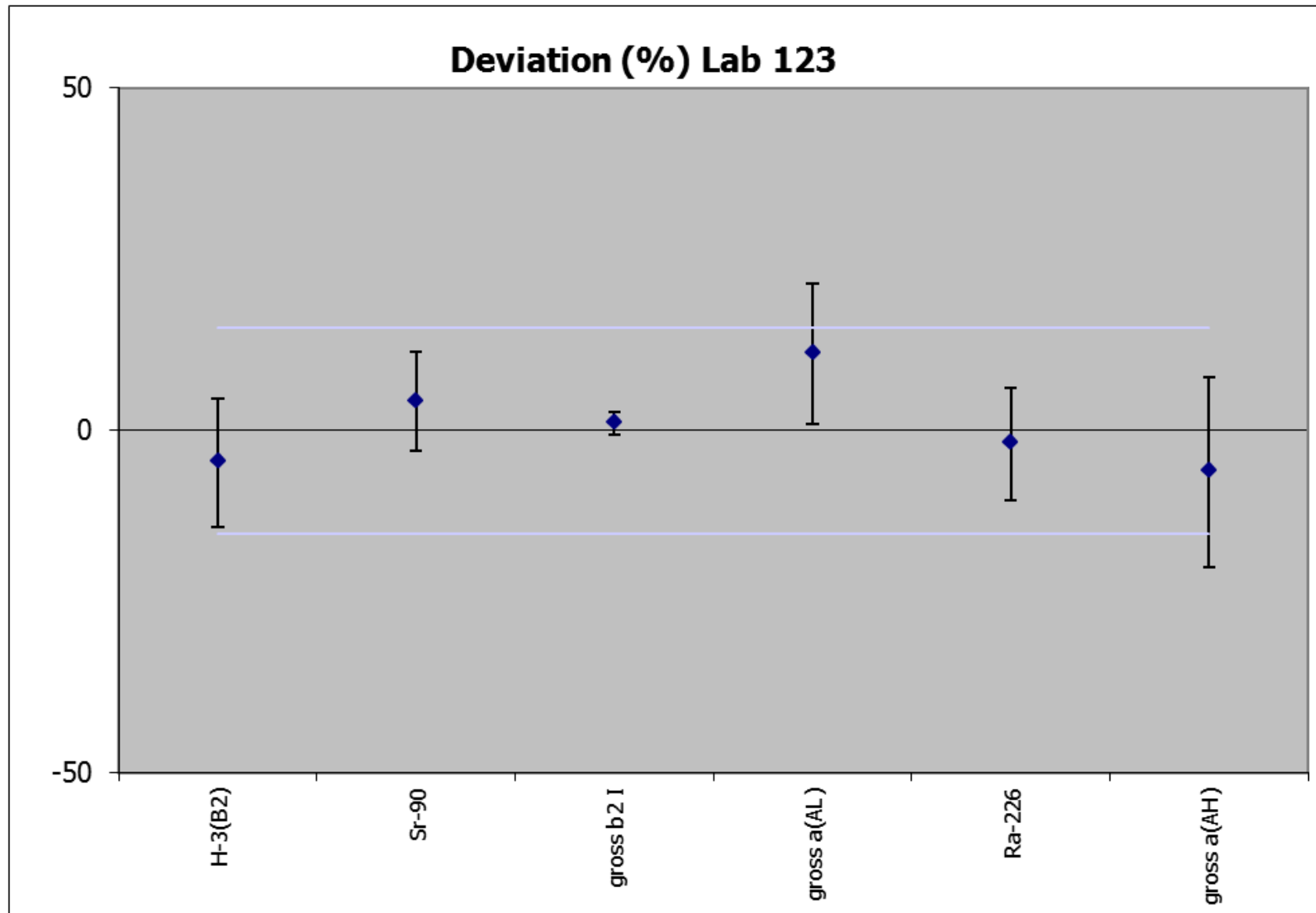
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Nuclide	Lab 114	Assigned Value	Deviation	zeta	z score
Am-241(S)	7.98 ± 0.48 ($\pm 6\%$)	6.8 ± 0.8 ($\pm 10\%$)	17.4	2.96	3.00
Co-60(S)	9.7 ± 1.0 ($\pm 10\%$)	9.1 ± 0.8 ($\pm 8\%$)	6.6	1.06	1.14
Cs-137(S)	10.3 ± 0.6 ($\pm 6\%$)	9.5 ± 0.8 ($\pm 8\%$)	9.0	1.93	1.54
U-234	8.4 ± 4.6 ($\pm 60\%$)	7.8 ± 1.0 ($\pm 12\%$)	8.5	0.28	1.46
U-235	0.40 ± 0.08 ($\pm 20\%$)	0.368 ± 0.030 ($\pm 8\%$)	8.7	0.75	1.50
U-238	8.4 ± 1.8 ($\pm 22\%$)	7.9 ± 1.0 ($\pm 12\%$)	7.2	0.57	1.23
Be-7	16.9 ± 4.8 ($\pm 28\%$)	17.7 ± 0.6 ($\pm 3.4\%$)	-4.6	-0.34	-0.78
Co-57(GL)	2.4 ± 0.6 ($\pm 26\%$)	2.352 ± 0.032 ($\pm 1.4\%$)	2.5	0.19	0.42
Cs-134	6.0 ± 0.8 ($\pm 12\%$)	6.28 ± 0.20 ($\pm 3\%$)	-3.7	-0.69	-0.63
Fe-59(GL)	10.4 ± 1.6 ($\pm 16\%$)	10.85 ± 0.22 ($\pm 2.0\%$)	-4.6	-0.64	-0.79
K-40	14.9 ± 3.6 ($\pm 24\%$)	16.9 ± 1.6 ($\pm 10\%$)	-11.6	-1.02	-2.00
Na-22	11.5 ± 1.4 ($\pm 12\%$)	11.74 ± 0.26 ($\pm 2.2\%$)	-2.1	-0.36	-0.35
Nb-95	13.7 ± 4.6 ($\pm 34\%$)	12.96 ± 0.22 ($\pm 1.8\%$)	5.5	0.31	0.94
Zr-95	5.3 ± 1.0 ($\pm 18\%$)	5.88 ± 0.10 ($\pm 1.6\%$)	-9.5	-1.11	-1.63
Sr-90	2.11 ± 0.24 ($\pm 12\%$)	1.613 ± 0.008 ($\pm 0.42\%$)	30.8	4.14	5.29



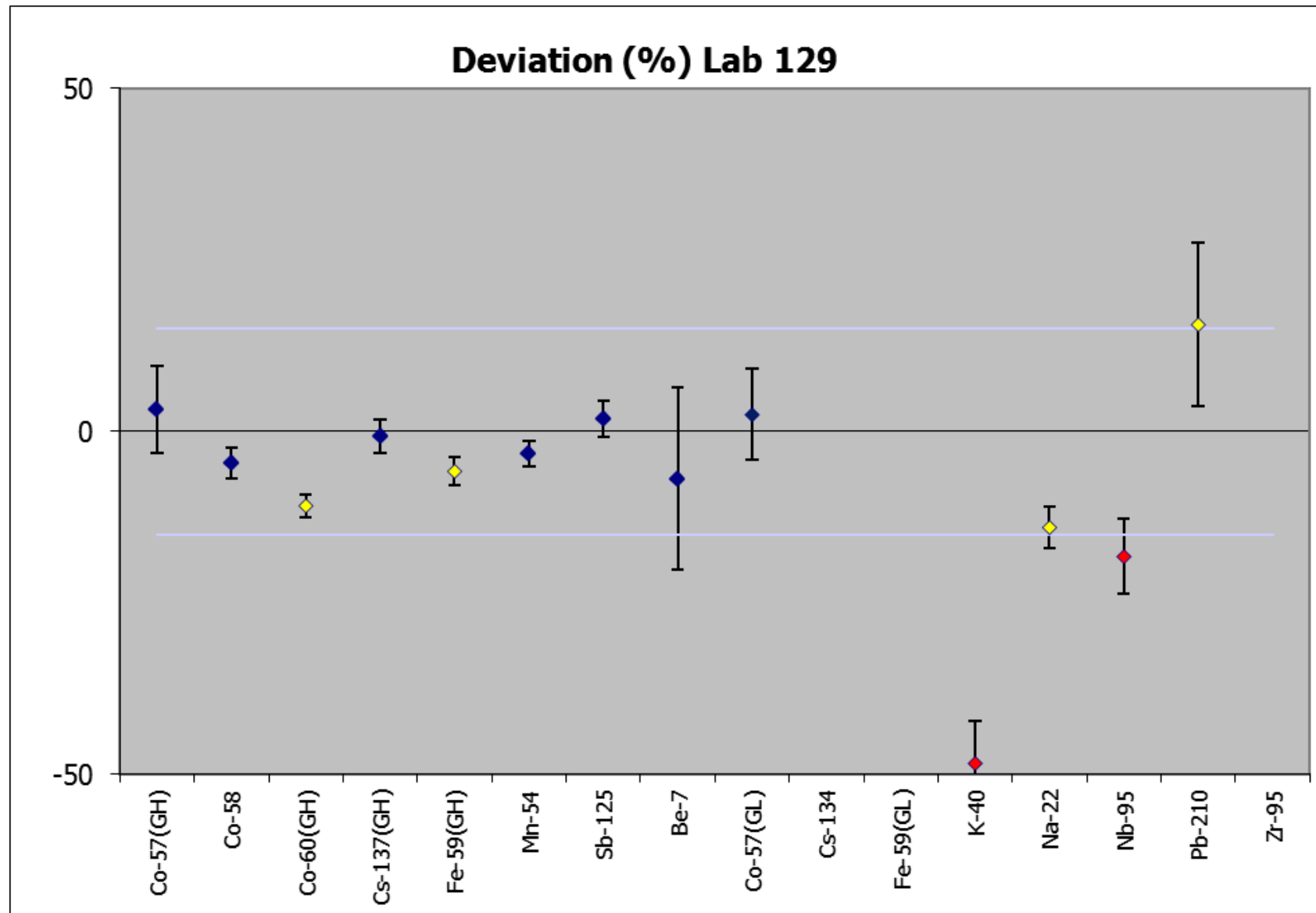
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Nuclide	Lab 120	Assigned Value	Deviation	zeta	z score
Am-241(S)	5.3 ± 0.8 (± 12 %)	6.8 ± 0.8 (± 10 %)	-21.6	-3.23	-3.70
Co-60(S)	8.5 ± 1.0 (± 10 %)	9.1 ± 0.8 (± 8 %)	-7.0	-1.13	-1.19
Cs-137(S)	9.1 ± 1.0 (± 10 %)	9.5 ± 0.8 (± 8 %)	-3.8	-0.63	-0.65
U-234	7.1 ± 0.8 (± 12 %)	7.8 ± 1.0 (± 12 %)	-9.2	-1.20	-1.58
U-235	0.362 ± 0.050 (± 14 %)	0.368 ± 0.030 (± 8 %)	-1.6	-0.21	-0.28
U-238	7.1 ± 1.0 (± 12 %)	7.9 ± 1.0 (± 12 %)	-9.6	-1.26	-1.65
H-3(B1)	1.69 ± 0.14 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	13.2	2.79	2.27
Tc-99	1.58 ± 0.14 (± 10 %)	1.633 ± 0.008 (± 0.44 %)	-3.5	-0.82	-0.60
I-129	0.52 ± 0.08 (± 14 %)	0.3909 ± 0.0040 (± 1.0 %)	33.5	3.96	5.76
H-3(B2)	0.430 ± 0.040 (± 10 %)	0.3429 ± 0.0048 (± 1.4 %)	25.4	4.32	4.36
Fe-55	1.46 ± 0.14 (± 10 %)	1.46 ± 0.06 (± 3.6 %)	0.1	0.02	0.02
Sr-90	1.67 ± 0.20 (± 12 %)	1.613 ± 0.008 (± 0.42 %)	3.5	0.54	0.61
Pu-241	0.90 ± 0.10 (± 12 %)	0.799 ± 0.018 (± 2.2 %)	12.1	1.99	2.08



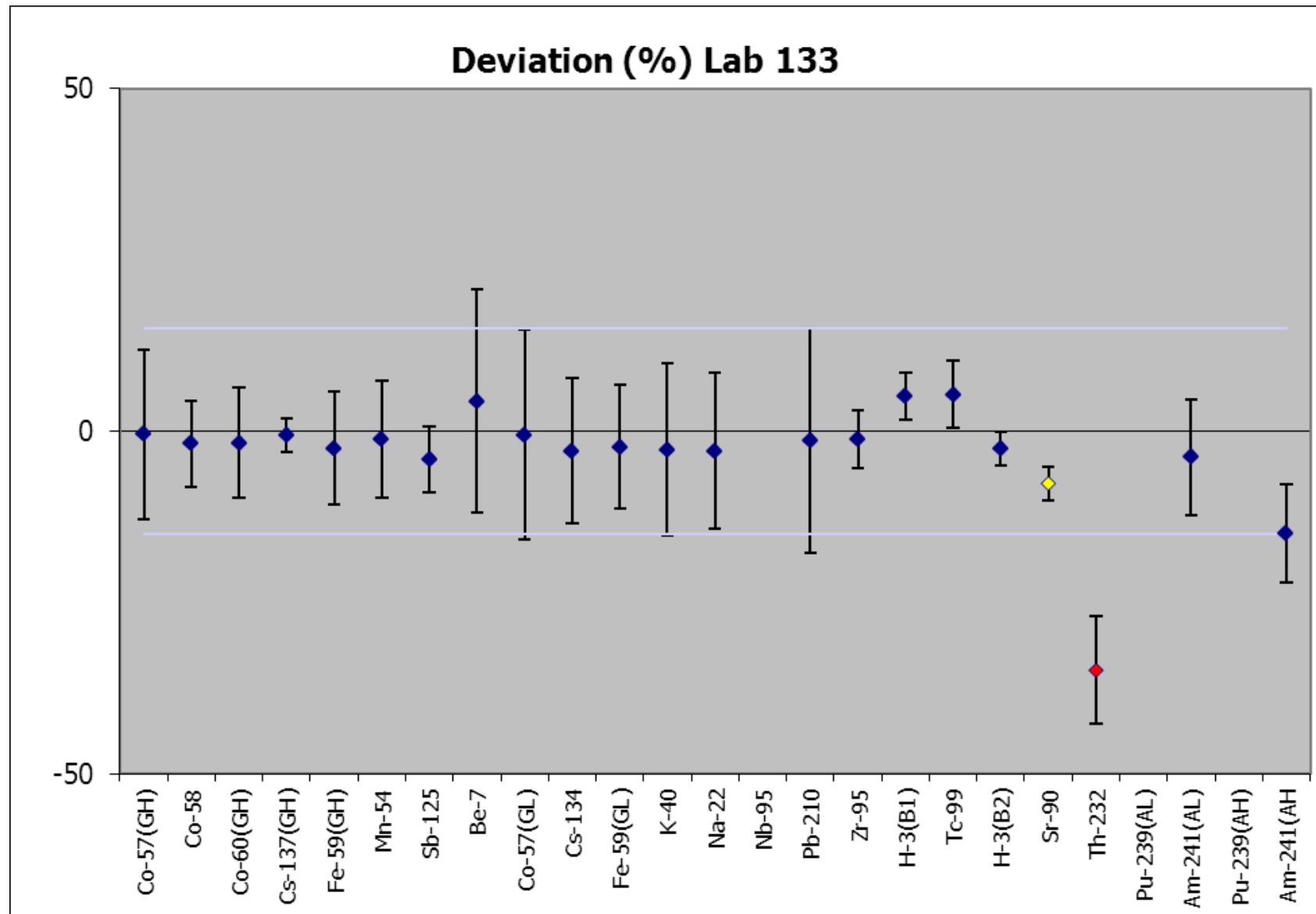
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Nuclide	Lab 123	Assigned Value	Deviation	zeta	z score
H-3(B2)	0.33 ± 0.08 (± 20 %)	0.3429 ± 0.0048 (± 1.4 %)	-4.6	-0.50	-0.80
Sr-90	1.68 ± 0.24 (± 14 %)	1.613 ± 0.008 (± 0.42 %)	4.3	0.59	0.74
gross β (B2)	3.26 ± 0.10 (± 3.2 %)	3.226 ± 0.014 (± 0.42 %)	1.1	0.66	0.18
gross α (AL)	72 ± 8 (± 12 %)	65 ± 10 (± 16 %)	11.2	1.17	1.93
Ra-226	3.7 ± 0.6 (± 16 %)	3.81 ± 0.10 (± 2.6 %)	-1.9	-0.24	-0.33
gross α (AH)	41.0 ± 2.4 (± 6 %)	44 ± 12 (± 28 %)	-6.1	-0.41	-1.04



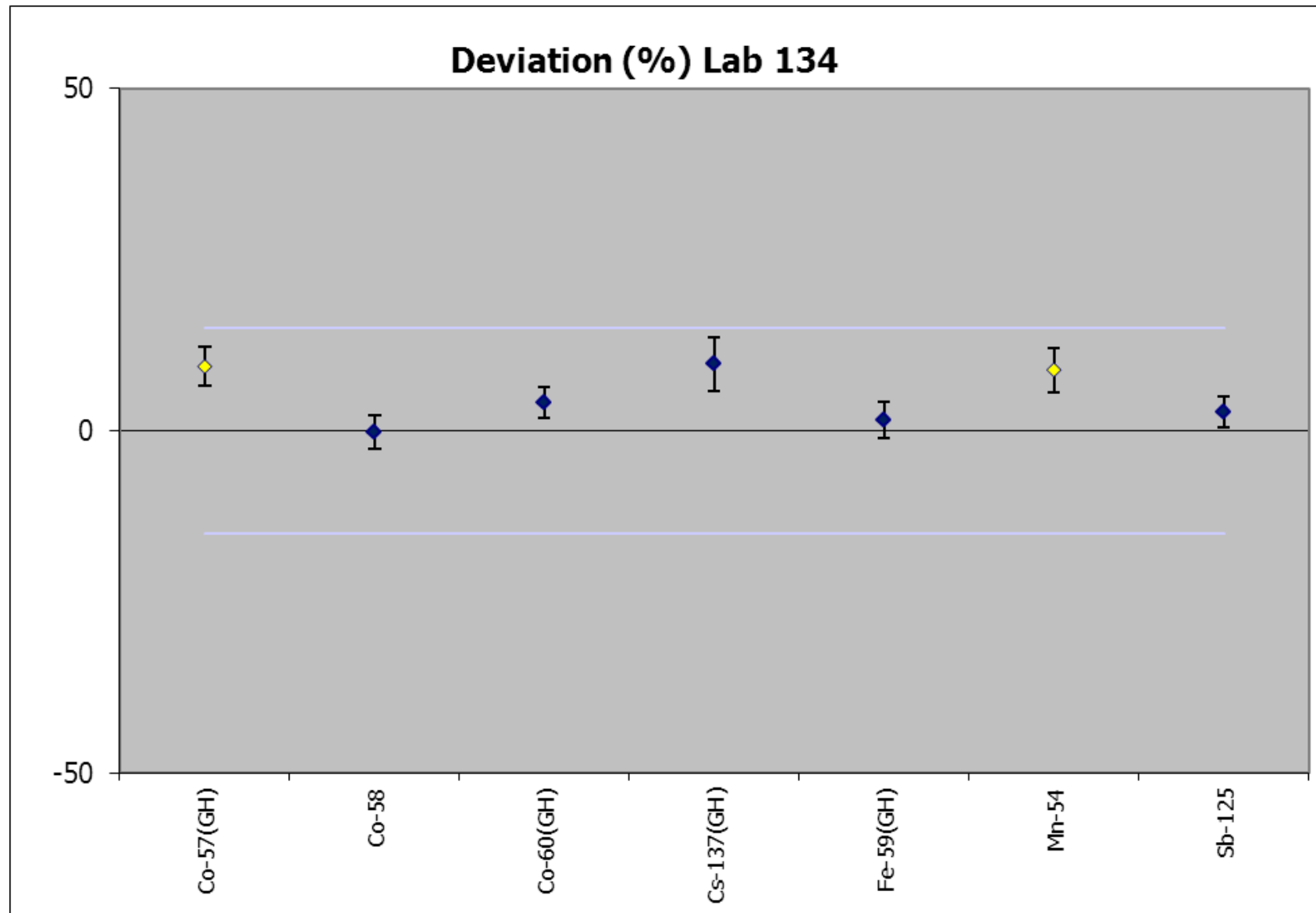
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Nuclide	Lab 129	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.84 ± 0.10 (± 12 %)	0.814 ± 0.022 (± 2.8 %)	3.2	0.52	0.56
Co-58	17.7 ± 0.8 (± 4.6 %)	18.54 ± 0.28 (± 1.6 %)	-4.6	-1.98	-0.78
Co-60(GH)	16.7 ± 0.6 (± 3.6 %)	18.73 ± 0.08 (± 0.42 %)	-10.8	-6.69	-1.86
Cs-137(GH)	7.10 ± 0.32 (± 4.6 %)	7.15 ± 0.14 (± 2.0 %)	-0.8	-0.31	-0.13
Fe-59(GH)	14.2 ± 0.6 (± 4.2 %)	15.07 ± 0.12 (± 0.8 %)	-5.8	-2.85	-1.00
Mn-54	14.4 ± 0.6 (± 3.8 %)	14.88 ± 0.12 (± 0.8 %)	-3.2	-1.67	-0.55
Sb-125	2.34 ± 0.12 (± 6 %)	2.297 ± 0.022 (± 1.0 %)	1.9	0.71	0.32
Be-7	16.5 ± 4.6 (± 28 %)	17.7 ± 0.6 (± 3.4 %)	-6.9	-0.52	-1.19
Co-57(GL)	2.41 ± 0.32 (± 14 %)	2.352 ± 0.032 (± 1.4 %)	2.5	0.37	0.42
Cs-134	2.03 ± 0.24 (± 12 %)	6.28 ± 0.20 (± 3 %)	-67.7	-27.78	-11.62
Fe-59(GL)	3.0 ± 1.4 (± 48 %)	10.85 ± 0.22 (± 2.0 %)	-72.4	-10.93	-12.43
K-40	8.7 ± 2.0 (± 22 %)	16.9 ± 1.6 (± 10 %)	-48.4	-6.64	-8.31
Na-22	10.1 ± 0.8 (± 8 %)	11.74 ± 0.26 (± 2.2 %)	-14.0	-4.65	-2.40
Nb-95	10.6 ± 1.4 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	-18.2	-3.33	-3.13
Pb-210	17.7 ± 3.6 (± 20 %)	15.31 ± 0.34 (± 2.2 %)	15.6	1.31	2.68
Zr-95	1.9 ± 0.8 (± 40 %)	5.88 ± 0.10 (± 1.6 %)	-68.2	-10.75	-11.71



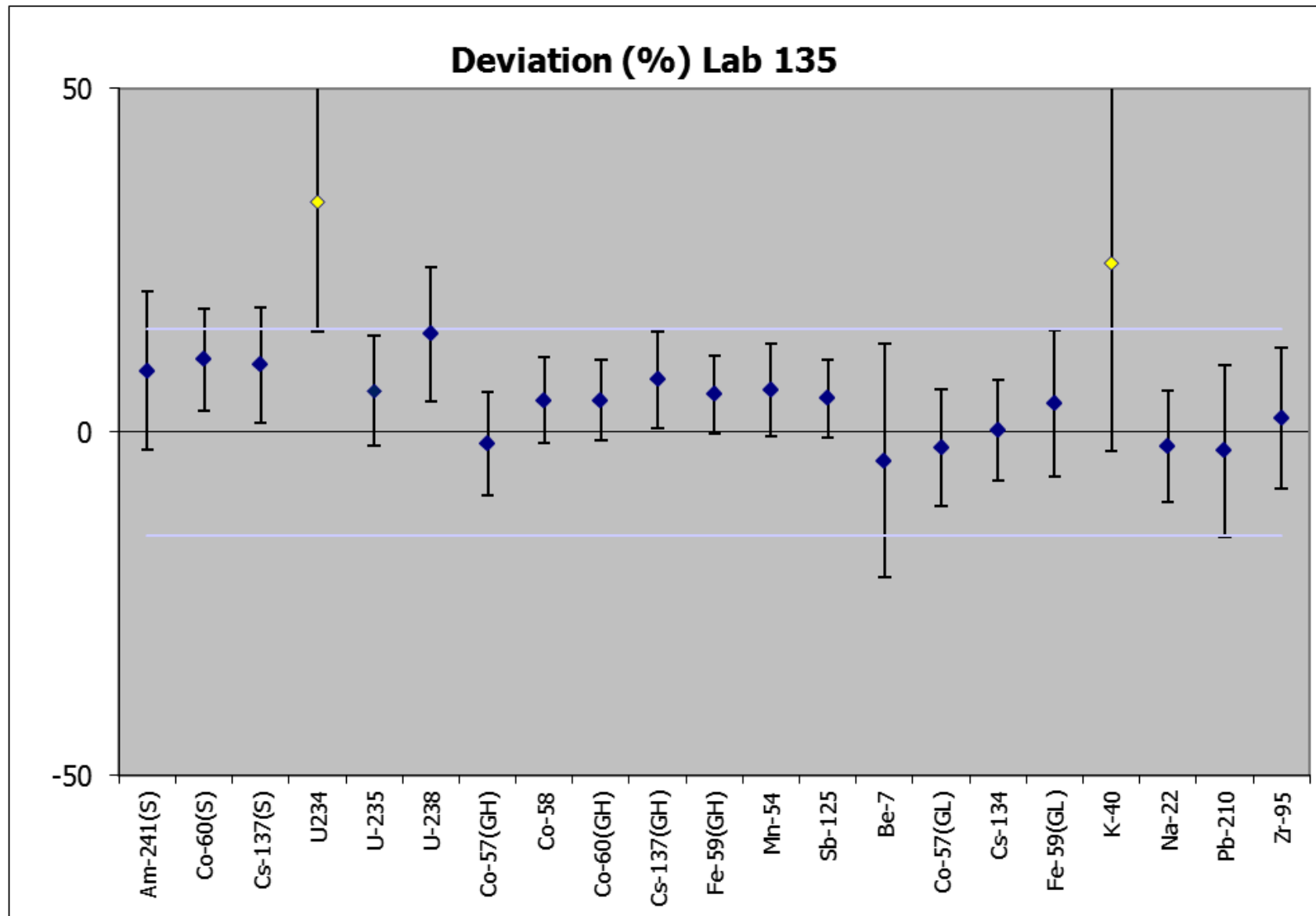
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Nuclide	Lab 133	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.81 ± 0.20 (± 24 %)	0.814 ± 0.022 (± 2.8 %)	-0.4	-0.04	-0.08
Co-58	18.2 ± 2.4 (± 14 %)	18.54 ± 0.28 (± 1.6 %)	-1.9	-0.29	-0.32
Co-60(GH)	18.4 ± 3.0 (± 16 %)	18.73 ± 0.08 (± 0.42 %)	-1.7	-0.22	-0.30
Cs-137(GH)	7.11 ± 0.32 (± 4.6 %)	7.15 ± 0.14 (± 2.0 %)	-0.6	-0.25	-0.11
Fe-59(GH)	14.7 ± 2.4 (± 18 %)	15.07 ± 0.12 (± 0.8 %)	-2.5	-0.30	-0.43
Mn-54	14.7 ± 2.6 (± 18 %)	14.88 ± 0.12 (± 0.8 %)	-1.2	-0.14	-0.20
Sb-125	2.20 ± 0.22 (± 10 %)	2.297 ± 0.022 (± 1.0 %)	-4.2	-0.88	-0.72
Be-7	18 ± 6 (± 32 %)	17.7 ± 0.6 (± 3.4 %)	4.4	0.27	0.75
Co-57(GL)	2.3 ± 0.8 (± 30 %)	2.352 ± 0.032 (± 1.4 %)	-0.5	-0.03	-0.09
Cs-134	6.1 ± 1.4 (± 22 %)	6.28 ± 0.20 (± 3 %)	-2.9	-0.27	-0.49
Fe-59(GL)	10.6 ± 2.0 (± 18 %)	10.85 ± 0.22 (± 2.0 %)	-2.3	-0.26	-0.40
K-40	16.4 ± 4.0 (± 24 %)	16.9 ± 1.6 (± 10 %)	-2.7	-0.21	-0.46
Na-22	11.4 ± 2.6 (± 24 %)	11.74 ± 0.26 (± 2.2 %)	-2.9	-0.26	-0.50
Nb-95	23.9 ± 3.0 (± 12 %)	12.96 ± 0.22 (± 1.8 %)	84.4	7.37	14.50
Pb-210	15.1 ± 5.0 (± 34 %)	15.31 ± 0.34 (± 2.2 %)	-1.4	-0.08	-0.24
Zr-95	5.81 ± 0.48 (± 8 %)	5.88 ± 0.10 (± 1.6 %)	-1.2	-0.28	-0.20
H-3(B1)	1.57 ± 0.10 (± 8 %)	1.493 ± 0.020 (± 1.4 %)	5.2	1.52	0.89
Tc-99	1.72 ± 0.16 (± 10 %)	1.633 ± 0.008 (± 0.44 %)	5.4	1.09	0.92
H-3(B2)	0.334 ± 0.016 (± 4.8 %)	0.3429 ± 0.0048 (± 1.4 %)	-2.6	-1.07	-0.45
Sr-90	1.49 ± 0.08 (± 6 %)	1.613 ± 0.008 (± 0.42 %)	-7.6	-3.06	-1.31
Th-232	2.4 ± 0.6 (± 24 %)	3.76 ± 0.08 (± 2.0 %)	-34.9	-4.45	-5.99
Pu-239(AL)	4.3 ± 1.2 (± 24 %)	18.18 ± 0.08 (± 0.38 %)	-76.2	-26.10	-13.09
Am-241(AL)	3.4 ± 0.6 (± 18 %)	3.532 ± 0.022 (± 0.6 %)	-3.8	-0.45	-0.65
Pu-239(AH)	1.35 ± 0.24 (± 18 %)	6.138 ± 0.026 (± 0.42 %)	-78.0	-41.37	-13.40
Am-241(AH)	3.2 ± 0.6 (± 18 %)	3.786 ± 0.016 (± 0.42 %)	-15.0	-2.08	-2.57



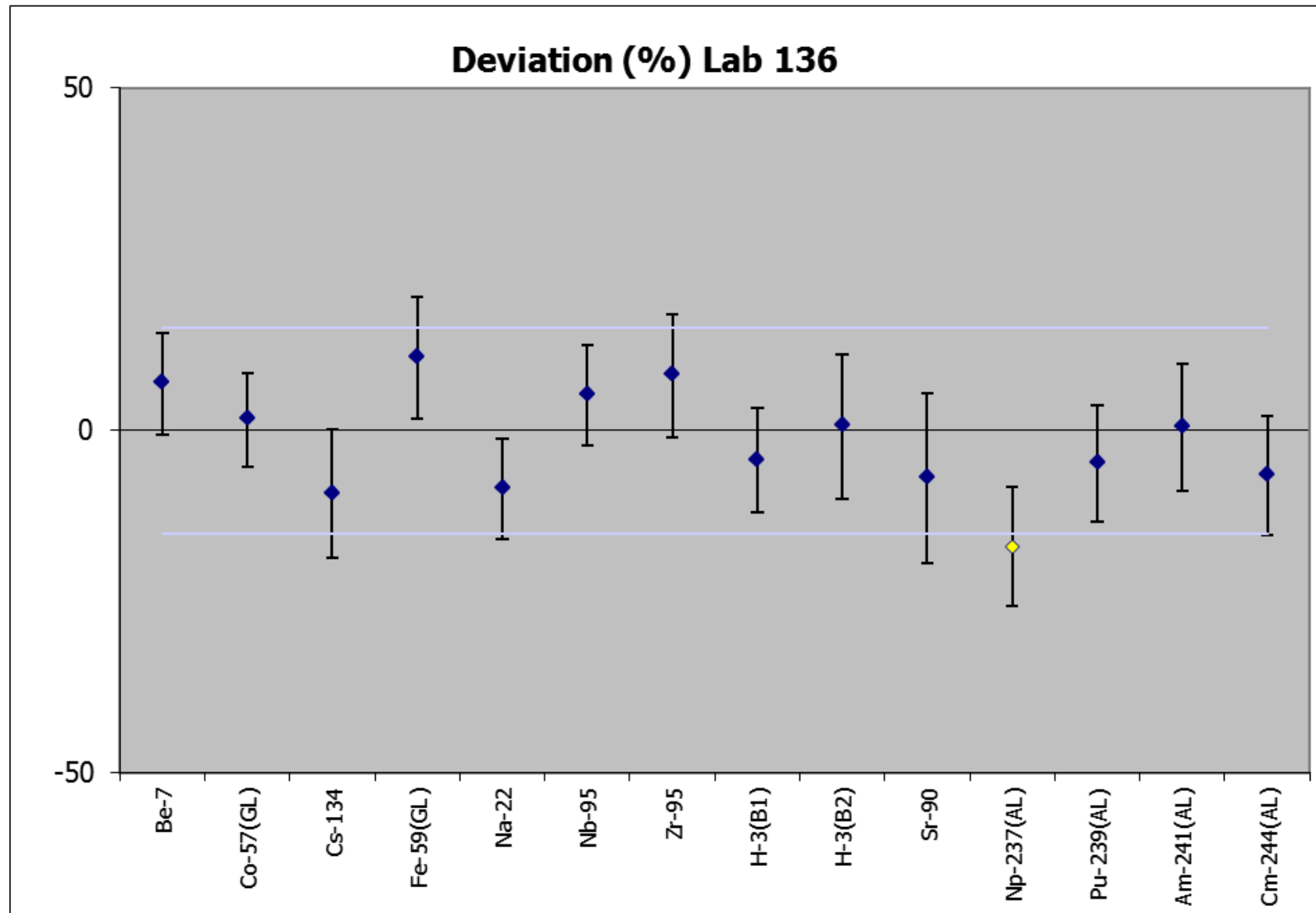
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Nuclide	Lab 134	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.890 ± 0.040 (± 4.4 %)	0.814 ± 0.022 (± 2.8 %)	9.4	3.34	1.61
Co-58	18.5 ± 1.0 (± 4.6 %)	18.54 ± 0.28 (± 1.6 %)	-0.2	-0.10	-0.04
Co-60(GH)	19.5 ± 1.0 (± 4.4 %)	18.73 ± 0.08 (± 0.42 %)	4.1	1.79	0.71
Cs-137(GH)	7.8 ± 0.6 (± 8 %)	7.15 ± 0.14 (± 2.0 %)	9.7	2.49	1.67
Fe-59(GH)	15.3 ± 0.8 (± 6 %)	15.07 ± 0.12 (± 0.8 %)	1.5	0.56	0.26
Mn-54	16.2 ± 1.0 (± 6 %)	14.88 ± 0.12 (± 0.8 %)	8.9	2.74	1.53
Sb-125	2.36 ± 0.10 (± 4.2 %)	2.297 ± 0.022 (± 1.0 %)	2.8	1.23	0.47



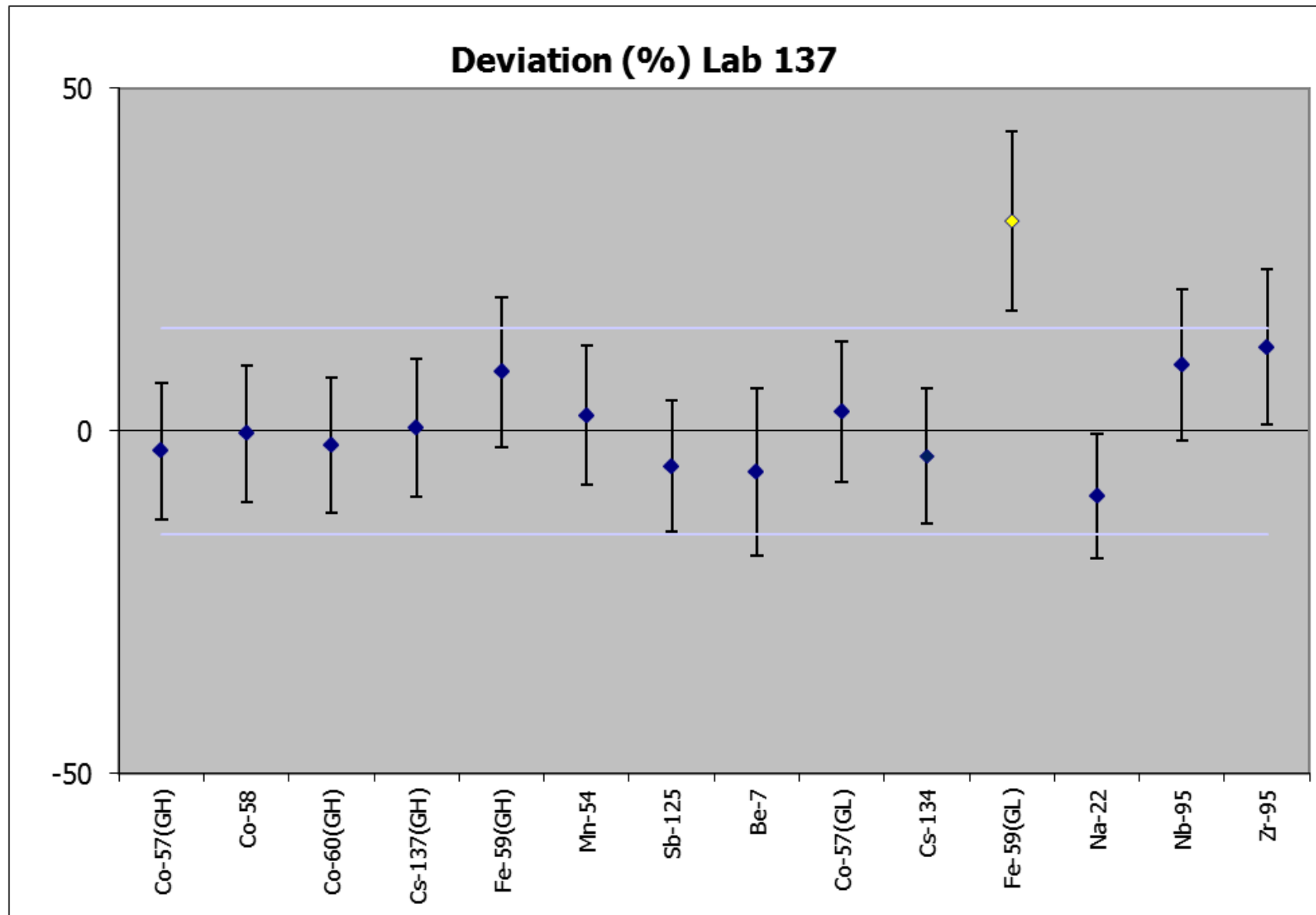
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Nuclide	Lab 135	Assigned Value	Deviation	zeta	z score
Am-241(S)	7.4 ± 1.4 (± 18 %)	6.8 ± 0.8 (± 10 %)	8.9	0.79	1.53
Co-60(S)	10.1 ± 1.2 (± 12 %)	9.1 ± 0.8 (± 8 %)	10.6	1.47	1.81
Cs-137(S)	10.4 ± 1.4 (± 14 %)	9.5 ± 0.8 (± 8 %)	9.8	1.20	1.69
U-234	10.4 ± 2.8 (± 26 %)	7.8 ± 1.0 (± 12 %)	33.5	1.85	5.76
U-235	0.39 ± 0.05 (± 14 %)	0.368 ± 0.030 (± 8 %)	6.0	0.76	1.03
U-238	9.0 ± 1.2 (± 14 %)	7.9 ± 1.0 (± 12 %)	14.3	1.53	2.45
Co-57(GH)	0.80 ± 0.12 (± 16 %)	0.814 ± 0.022 (± 2.8 %)	-1.7	-0.22	-0.29
Co-58	19.4 ± 2.4 (± 12 %)	18.54 ± 0.28 (± 1.6 %)	4.6	0.74	0.79
Co-60(GH)	19.6 ± 2.2 (± 12 %)	18.73 ± 0.08 (± 0.42 %)	4.7	0.79	0.80
Cs-137(GH)	7.7 ± 1.0 (± 14 %)	7.15 ± 0.14 (± 2.0 %)	7.6	1.08	1.31
Fe-59(GH)	15.9 ± 1.8 (± 12 %)	15.07 ± 0.12 (± 0.8 %)	5.5	0.97	0.94
Mn-54	15.8 ± 2.0 (± 14 %)	14.88 ± 0.12 (± 0.8 %)	6.2	0.92	1.07
Sb-125	2.41 ± 0.26 (± 12 %)	2.297 ± 0.022 (± 1.0 %)	4.9	0.87	0.85
Be-7	17 ± 6 (± 36 %)	17.7 ± 0.6 (± 3.4 %)	-4.1	-0.24	-0.71
Co-57(GL)	2.30 ± 0.40 (± 18 %)	2.352 ± 0.032 (± 1.4 %)	-2.2	-0.26	-0.38
Cs-134	6.3 ± 1.0 (± 14 %)	6.28 ± 0.20 (± 3 %)	0.3	0.04	0.05
Fe-59(GL)	11.3 ± 2.4 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	4.1	0.39	0.71
K-40	21 ± 10 (± 42 %)	16.9 ± 1.6 (± 10 %)	24.6	0.91	4.23
Na-22	11.5 ± 2.0 (± 16 %)	11.74 ± 0.26 (± 2.2 %)	-2.1	-0.25	-0.35
Pb-210	14.9 ± 3.8 (± 26 %)	15.31 ± 0.34 (± 2.2 %)	-2.7	-0.22	-0.46
Zr-95	6.0 ± 1.2 (± 20 %)	5.88 ± 0.10 (± 1.6 %)	2.1	0.20	0.35



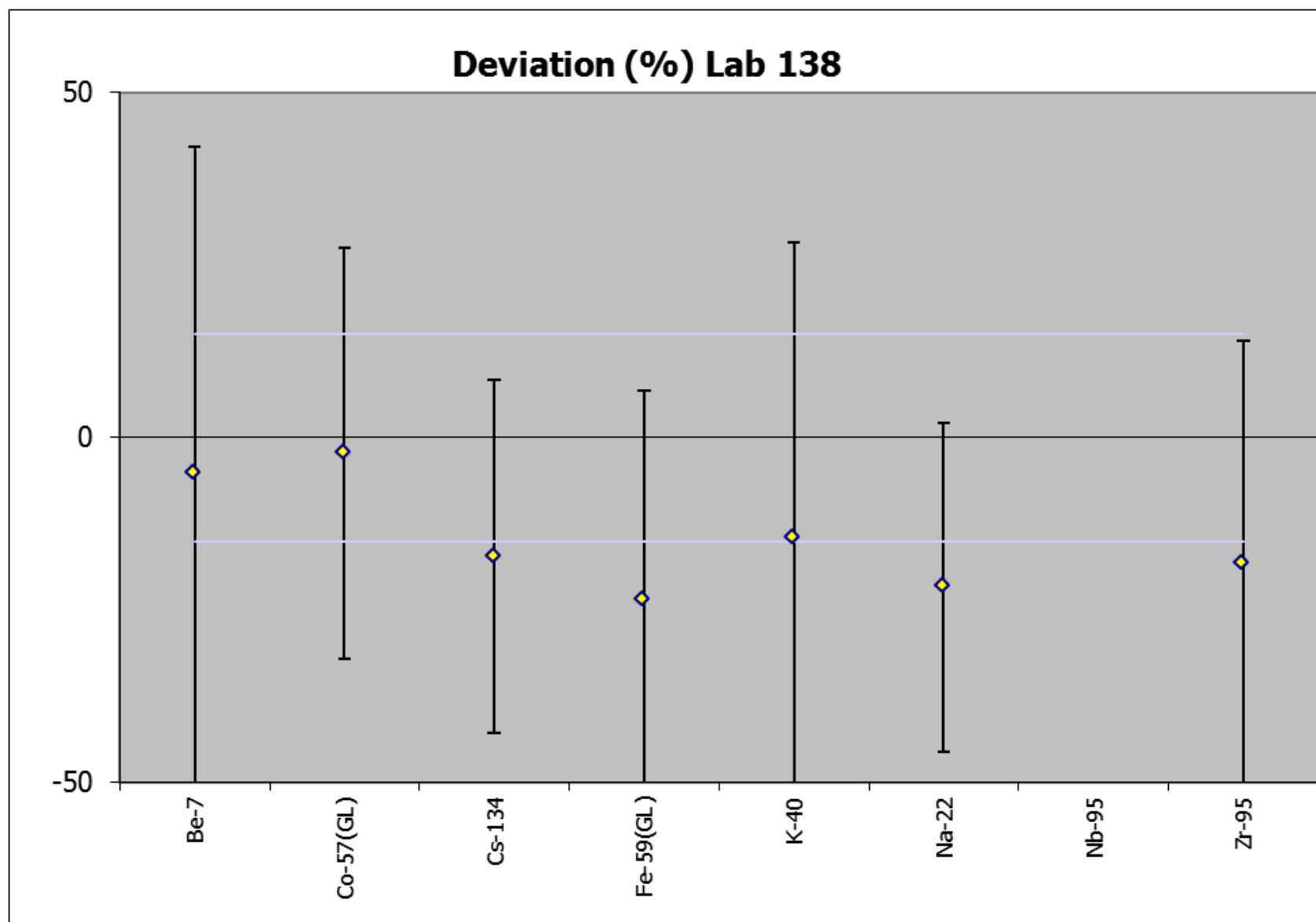
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Nuclide	Lab 136	Assigned Value	Deviation	zeta	z score
Be-7	19.0 ± 2.6 (± 14 %)	17.7 ± 0.6 (± 3.4 %)	6.9	0.94	1.18
Co-57(GL)	2.39 ± 0.32 (± 14 %)	2.352 ± 0.032 (± 1.4 %)	1.6	0.24	0.28
Cs-134	5.7 ± 1.2 (± 20 %)	6.28 ± 0.20 (± 3 %)	-9.2	-0.99	-1.59
Fe-59(GL)	12.0 ± 2.0 (± 16 %)	10.85 ± 0.22 (± 2.0 %)	10.6	1.19	1.82
Na-22	10.7 ± 1.8 (± 16 %)	11.74 ± 0.26 (± 2.2 %)	-8.5	-1.17	-1.47
Nb-95	13.6 ± 2.0 (± 14 %)	12.96 ± 0.22 (± 1.8 %)	5.2	0.70	0.89
Zr-95	6.4 ± 1.2 (± 16 %)	5.88 ± 0.10 (± 1.6 %)	8.0	0.89	1.38
H-3(B1)	1.43 ± 0.22 (± 16 %)	1.493 ± 0.020 (± 1.4 %)	-4.3	-0.57	-0.74
H-3(B2)	0.34 ± 0.08 (± 20 %)	0.3429 ± 0.0048 (± 1.4 %)	0.6	0.06	0.10
Sr-90	1.50 ± 0.40 (± 26 %)	1.613 ± 0.008 (± 0.42 %)	-6.9	-0.56	-1.19
Np-237(AL)	14.9 ± 3.2 (± 20 %)	17.95 ± 0.36 (± 2.0 %)	-16.9	-1.95	-2.91
Pu-239(AL)	17.3 ± 3.0 (± 18 %)	18.18 ± 0.08 (± 0.38 %)	-4.7	-0.56	-0.81
Am-241(AL)	3.6 ± 0.8 (± 18 %)	3.532 ± 0.022 (± 0.6 %)	0.5	0.05	0.09
Cm-244(AL)	10.3 ± 2.0 (± 18 %)	10.97 ± 0.08 (± 0.8 %)	-6.5	-0.75	-1.11



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Nuclide	Lab 137	Assigned Value	Deviation	zeta	z score
Co-57(GH)	0.79 ± 0.16 (± 20 %)	0.814 ± 0.022 (± 2.8 %)	-2.9	-0.29	-0.50
Co-58	18.5 ± 3.6 (± 20 %)	18.54 ± 0.28 (± 1.6 %)	-0.3	-0.03	-0.06
Co-60(GH)	18.3 ± 3.6 (± 20 %)	18.73 ± 0.08 (± 0.42 %)	-2.1	-0.21	-0.35
Cs-137(GH)	7.2 ± 1.4 (± 20 %)	7.15 ± 0.14 (± 2.0 %)	0.5	0.05	0.09
Fe-59(GH)	16.4 ± 3.2 (± 20 %)	15.07 ± 0.12 (± 0.8 %)	8.6	0.79	1.48
Mn-54	15.2 ± 3.0 (± 20 %)	14.88 ± 0.12 (± 0.8 %)	2.3	0.23	0.40
Sb-125	2.18 ± 0.44 (± 20 %)	2.297 ± 0.022 (± 1.0 %)	-5.1	-0.53	-0.87
Be-7	16.7 ± 4.4 (± 26 %)	17.7 ± 0.6 (± 3.4 %)	-6.0	-0.49	-1.03
Co-57(GL)	2.42 ± 0.48 (± 20 %)	2.352 ± 0.032 (± 1.4 %)	2.9	0.28	0.50
Cs-134	6.0 ± 1.2 (± 20 %)	6.28 ± 0.20 (± 3 %)	-3.7	-0.37	-0.63
Fe-59(GL)	14.2 ± 2.8 (± 20 %)	10.85 ± 0.22 (± 2.0 %)	30.7	2.34	5.27
Na-22	10.6 ± 2.2 (± 20 %)	11.74 ± 0.26 (± 2.2 %)	-9.6	-1.05	-1.64
Nb-95	14.2 ± 2.8 (± 20 %)	12.96 ± 0.22 (± 1.8 %)	9.6	0.88	1.66
Zr-95	6.6 ± 1.4 (± 20 %)	5.88 ± 0.10 (± 1.6 %)	12.3	1.09	2.11



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Nuclide	Lab 138	Assigned Value	Deviation	zeta	z score
Be-7	17 ± 16 (± 100 %)	17.7 ± 0.6 (± 3.4 %)	-5.2	-0.11	-0.90
Co-57(GL)	2.3 ± 1.4 (± 60 %)	2.352 ± 0.032 (± 1.4 %)	-2.2	-0.07	-0.38
Cs-134	5.2 ± 3.2 (± 60 %)	6.28 ± 0.20 (± 3 %)	-17.2	-0.67	-2.95
Fe-59(GL)	8 ± 8 (± 80 %)	10.85 ± 0.22 (± 2.0 %)	-23.5	-0.77	-4.04
K-40	14 ± 14 (± 100 %)	16.9 ± 1.6 (± 10 %)	-14.5	-0.34	-2.50
Na-22	9 ± 6 (± 60 %)	11.74 ± 0.26 (± 2.2 %)	-21.6	-0.91	-3.72
Nb-95	2.8 ± 2.8 (± 100 %)	12.96 ± 0.22 (± 1.8 %)	-78.4	-7.23	-13.46
Zr-95	4.8 ± 3.8 (± 80 %)	5.88 ± 0.10 (± 1.6 %)	-18.4	-0.57	-3.15

16. CONCLUSION

The 2011 proficiency test exercise was successfully completed, with all but one of the laboratories returning data.

Of the 973 results returned, 80 % were classified as 'in agreement' with the assigned value, 12 % of the results were 'questionable', and 8 % of the results were 'discrepant'.

None of the results from the GH sample type were classified as discrepant with the assigned values.

The measurement of the nuclides ^{129}I , ^{232}Th and ^{235}U seemed to be the most challenging for the labs to measure with only 50 % of results were classified as 'in agreement with the assigned values'.

There was a significant negative bias between the participants' results and the assigned result for ^{232}Th , ^{226}Ra , ^{244}Cm (AH) and ^{22}Na .

There was a significant positive bias between the participants' results and the assigned result for ^{237}Np (AH), ^{241}Pu , ^{57}Co (GH) and ^{59}Fe (GL).

17. LITERATURE

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