

Analysis Report for Energy Calibration Sample
Annual 2022

ENERGY CALIBRATION REPORT

Detector Name : LYNX_8

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 8/2/2022 2:07:25PM
by : Administrator
Energy Calibrate Type : POLY

$$\text{Energy (keV)} = -0.362 + 0.499*\text{ch} + 3.23\text{E-08}*\text{ch}^2 + 0.00\text{E+00}*\text{ch}^3$$

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 8/2/2022 2:07:25PM
by : Administrator

$$\text{FWHM} = 0.605 + 3.57\text{E-02}*\text{E}^{1/2}$$

$$\text{LOW TAIL} = 3.56\text{E-01} + 6.94\text{E-04}*\text{E}$$

ENERGY CALIBRATION RESULTS TABLE

Centroid Channel	Centroid error	Energy (keV)
176.92	0.04	88.00
245.02	0.12	122.10
332.78	0.36	165.90
1324.76	0.03	661.70
2348.30	0.02	1173.20
2666.96	0.01	1332.50
3674.32	0.04	1836.10

SHAPE CALIBRATION RESULTS TABLE

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Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
88.00	1.95	0.10	0.93	0.21
122.10	2.11	0.29	0.78	0.39
165.90	4.23	0.51	0.72	0.22
661.70	2.95	0.07	1.90	0.36
1173.20	3.64	0.05	2.45	0.28
1332.50	3.81	0.03	2.93	0.31
1836.10	4.60	0.12	2.71	0.37



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ENERGY CALIBRATION REPORT

Detector Name : LYNX_20

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 9/8/2022 9:31:28AM
by : Administrator
Energy Calibrate Type : POLY

Energy (keV) = -0.314 + 0.500*ch + -2.46E-08*ch^2 + 0.00E+00*ch^3

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 9/8/2022 9:31:28AM
by : Administrator

FWHM = 0.847 + 3.14E-02*E^1/2

LOW TAIL = 6.91E-01 + 4.56E-04*E

ENERGY CALIBRATION RESULTS TABLE

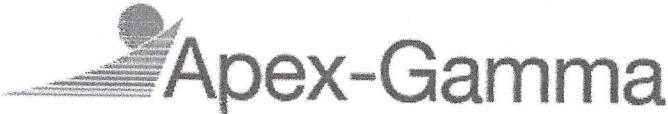
Centroid Channel	Centroid error	Energy (keV)
176.57	0.06	88.00
244.57	0.13	122.10
332.40	0.48	165.90
1323.25	0.02	661.70
2345.88	0.02	1173.20
2664.27	0.01	1332.50
3671.26	0.07	1836.10

SHAPE CALIBRATION RESULTS TABLE

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<i>Energy</i> (keV)	<i>FWHM</i> <i>channels</i>	<i>FWHM</i> <i>error</i>	<i>TAIL</i> <i>channels</i>	<i>TAIL</i> <i>error</i>
88.00	2.40	0.16	1.18	0.37
122.10	2.64	0.34	1.03	0.46
165.90	7.08	0.82	1.66	0.60
661.70	3.22	0.06	2.17	0.35
1173.20	3.84	0.05	2.62	0.27
1332.50	3.98	0.03	2.90	0.21
1836.10	4.78	0.18	2.24	0.35



Analysis Report for Energy Calibration Sample
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ENERGY CALIBRATION REPORT

Detector Name : LYNX_50

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 6/13/2023 10:23:56AM
by : Administrator
Energy Calibrate Type : POLY

Energy (keV) = -0.845 + 0.541*ch + -6.87E-09*ch^2 + 0.00E+00*ch^3

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 6/13/2023 10:23:56AM
by : Administrator

FWHM = 1.437 + 2.37E-02*E^1/2

LOW TAIL = 7.42E-01 + 4.54E-04*E

ENERGY CALIBRATION RESULTS TABLE

Centroid Channel	Centroid error	Energy (keV)
164.12	0.06	88.00
227.01	0.12	122.10
308.71	0.43	165.90
1223.62	0.03	661.70
2168.44	0.03	1173.20
2462.57	0.02	1332.50
3392.69	0.43	1836.10

SHAPE CALIBRATION RESULTS TABLE

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Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
88.00	3.00	0.17	1.50	0.36
122.10	3.27	0.32	1.34	0.47
165.90	9.81	0.60	1.46	0.25
661.70	3.59	0.09	2.12	0.34
1173.20	4.10	0.08	2.33	0.24
1332.50	4.22	0.06	2.47	0.23
1836.10	14.74	0.68	2.91	0.41



Analysis Report for Energy Calibration Sample
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ENERGY CALIBRATION REPORT

Detector Name : LYNX_99

ENERGY CALIBRATION COEFFICIENTS

Energy Calibrate Performed on : 6/19/2023 9:00:36AM
by : Administrator
Energy Calibrate Type : POLY

Energy (keV) = -0.265 + 0.500*ch + 5.29E-08*ch^2 + 0.00E+00*ch^3

SHAPE CALIBRATION COEFFICIENTS

Shape Calibrate Performed on : 6/19/2023 9:00:36AM
by : Administrator

FWHM = 0.914 + 7.38E-02*E^1/2
LOW TAIL = 7.65E-01 + 7.52E-04*E

ENERGY CALIBRATION RESULTS TABLE

Centroid Channel	Centroid error	Energy (keV)
176.97	0.10	88.00
244.92	0.25	122.10
1321.75	0.02	661.70
2343.14	0.02	1173.20
2661.08	0.02	1332.50
3665.69	0.08	1836.10

SHAPE CALIBRATION RESULTS TABLE

Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
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Energy (keV)	FWHM channels	FWHM error	TAIL channels	TAIL error
88.00	4.36	0.25	1.56	0.30
122.10	5.01	0.64	1.31	0.46
661.70	5.46	0.06	2.67	0.14
1173.20	6.82	0.06	3.21	0.11
1332.50	7.24	0.04	3.53	0.09
1836.10	8.79	0.20	4.58	0.49



Analysis Report for Efficiency Calibration Sample
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EFFICIENCY CALIBRATION REPORT

Detector Name : LYNX 8
Geometry Description : 5 Dram Vial 10 cm.
Efficiency Calibration Performed on : 8/10/2022 12:57:20PM
by : Administrator
Efficiency Type Used : Empirical
Certificate File : 114733 Vial

Efficiency Triplets

Energy	% Efficiency	Error	Computed	Error	% Difference
88.00	6.18E-01	2.60E-02	6.12E-01	2.66E-02	5.90E-03
122.10	5.74E-01	2.05E-02	5.86E-01	2.35E-02	-1.15E-02
165.90	4.93E-01	2.45E-02	4.80E-01	2.76E-02	1.27E-02
391.70	2.00E-01	2.64E-02	1.80E-01	3.33E-02	2.02E-02
661.70	9.04E-02	3.71E-03	9.22E-02	4.13E-03	-1.81E-03
898.00	3.34E-02	1.37E-02	6.47E-02	3.41E-02	-3.12E-02
1173.20	4.97E-02	1.94E-03	4.90E-02	2.08E-03	7.27E-04
1332.50	4.37E-02	1.71E-03	4.35E-02	1.72E-03	2.27E-04
1836.10	3.28E-02	1.96E-03	3.33E-02	2.02E-03	-4.76E-04

DUAL Efficiency Calibration Equation

Single Equation Terms

Offset : -7.01E+01 0.00E+00
Slope : 4.09E+01
Quadratic : -9.21E+00
Cubic : 8.75E-01
4th Order : -3.03E-02
5th Order : 0.00E+00
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

EMPIRICAL Efficiency Calibration Equation

Analysis Report for Efficiency Calibration Sample
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Empirical Equation Terms

Scaling :	9.62E+02
Offset :	-7.42E+00
Slope :	1.07E+00
Quadratic :	2.31E-01
Cubic :	-4.13E-02
4th Order :	-3.03E-02
5th Order :	0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset :	-1.07E-04
Slope :	-3.50E+00
Quadratic :	4.18E+02
Cubic :	-4.59E+04
4th Order :	1.69E+06
5th Order :	0.00E+00
6th Order :	0.00E+00
7th Order :	0.00E+00
8th Order :	0.00E+00
9th Order :	0.00E+00

PEAK LOCATE REPORT

Peak Locate Performed on : 8/10/2022 12:57:00PM
 Peak Locate From Channel : 100
 Peak Locate To Channel : 4096
 Peak Search Sensitivity : 3.00

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	66.94	134.68	0.3059	3.65
2	74.95	150.62	0.2330	11.41
3	77.60	156.19	0.3247	4.67
4	85.63	172.00	0.2154	21.48
5	88.03	176.83	0.0403	512.47
6	92.00	184.74	0.1469	14.76
7	118.77	238.19	0.3936	4.22
8	122.04	244.92	0.0575	218.22
9	125.98	252.71	0.2744	6.24
10	136.39	273.67	0.1137	52.02
11	165.80	332.53	0.1196	36.96

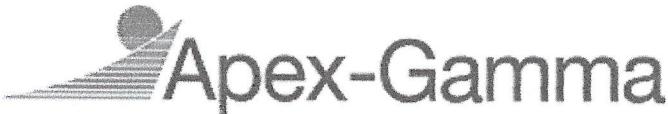
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Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
12	310.42	621.93	0.2249	10.02
13	391.66	784.50	0.2244	10.32
14	511.11	1023.53	0.2382	6.25
15	644.04	1289.52	0.1535	14.94
16	661.58	1324.66	0.0327	394.39
17	665.41	1332.71	0.1176	31.99
18	820.67	1642.93	0.3317	4.22
19	897.92	1797.50	0.2333	7.47
20	1142.20	2286.24	0.1680	9.10
21	1173.11	2348.11	0.0330	343.98
22	1176.99	2356.76	0.1475	21.58
23	1297.16	2596.25	0.1396	10.08
24	1332.39	2666.67	0.0332	312.88
25	1336.33	2675.64	0.1765	17.39
26	1460.79	2923.61	0.2419	5.45
27	1835.77	3673.73	0.1495	13.09

? = Adjacent peak noted

Errors quoted at 1.000sigma

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Analysis Report for Efficiency Calibration Sample
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EFFICIENCY CALIBRATION REPORT

Detector Name : LYNX 20
Geometry Description : 5 Dram Vial 10 cm.
Efficiency Calibration Performed on : 9/23/2022 7:35:21AM
by : Administrator
Efficiency Type Used : Empirical
Certificate File : 114733 Vial

Efficiency Triplets

Energy	% Efficiency	Error	Computed	Error	% Difference
88.00	8.41E-01	3.54E-02	8.47E-01	3.58E-02	-5.31E-03
122.10	8.14E-01	2.90E-02	8.02E-01	3.17E-02	1.29E-02
165.90	6.35E-01	5.16E-02	6.88E-01	7.38E-02	-5.28E-02
391.70	3.85E-01	5.84E-02	3.41E-01	7.30E-02	4.38E-02
661.70	2.11E-01	8.64E-03	2.11E-01	8.65E-03	-4.14E-04
898.00	1.21E-01	3.95E-02	1.62E-01	5.66E-02	-4.05E-02
1173.20	1.30E-01	5.07E-03	1.29E-01	5.10E-03	5.48E-04
1332.50	1.16E-01	4.54E-03	1.17E-01	4.55E-03	-2.27E-04
1836.10	9.06E-02	5.91E-03	9.05E-02	5.91E-03	8.52E-05

DUAL Efficiency Calibration Equation

Single Equation Terms

Offset :	-5.02E+01	0.00E+00
Slope :	2.93E+01	
Quadratic :	-6.80E+00	
Cubic :	6.74E-01	
4th Order :	-2.48E-02	
5th Order :	0.00E+00	
6th Order :	0.00E+00	
7th Order :	0.00E+00	
8th Order :	0.00E+00	
9th Order :	0.00E+00	

EMPIRICAL Efficiency Calibration Equation

Analysis Report for Efficiency Calibration Sample
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Empirical Equation Terms

Scaling :	9.62E+02
Offset :	-6.49E+00
Slope :	8.44E-01
Quadratic :	7.22E-02
Cubic :	6.96E-03
4th Order :	-2.48E-02
5th Order :	0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset :	-1.76E-04
Slope :	-2.84E+00
Quadratic :	2.11E+02
Cubic :	-1.89E+04
4th Order :	5.64E+05
5th Order :	0.00E+00
6th Order :	0.00E+00
7th Order :	0.00E+00
8th Order :	0.00E+00
9th Order :	0.00E+00

PEAK LOCATE REPORT

Peak Locate Performed on : 9/23/2022 7:26:39AM
 Peak Locate From Channel : 100
 Peak Locate To Channel : 4096
 Peak Search Sensitivity : 3.00

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	67.80	133.84	0.2993	4.68
2	76.17	156.02	0.3372	3.20
3	87.99	176.49	0.0380	349.78
4	122.00	244.48	0.0599	144.94
5	136.41	273.29	0.1220	37.61
6	165.78	331.98	0.1358	30.31
7	310.46	621.17	0.3046	5.86
8	391.63	783.42	0.2235	8.53
9	510.95	1021.93	0.2028	7.06
10	644.31	1288.51	0.3240	3.53
11	661.58	1323.05	0.0321	409.59

Analysis Report for Efficiency Calibration Sample
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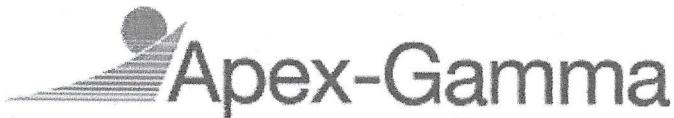
Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
12	821.01	1641.75	0.2721	4.34
13	897.93	1795.52	0.2562	5.49
14	1173.11	2345.64	0.0314	347.44
15	1296.87	2593.07	0.2367	5.08
16	1332.39	2664.08	0.0317	331.42
17	1400.94	2801.14	0.3147	3.50
18	1460.57	2920.35	0.2614	4.95
19	1836.00	3670.98	0.1468	13.79

? = Adjacent peak noted

Errors quoted at 1.000sigma

Analysis Report for Efficiency Calibration Sample

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Analysis Report for Efficiency Calibration Sample
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EFFICIENCY CALIBRATION REPORT

Detector Name : LYNX 50
Geometry Description : 5 Dram Vial 10 cm.
Efficiency Calibration Performed on : 3/30/2023 2:02:44PM
by : Administrator
Efficiency Type Used : Empirical
Certificate File : 114733 Vial

Efficiency Triplets

Energy	% Efficiency	Error	Computed	Error	% Difference
88.00	9.56E-01	4.02E-02	9.65E-01	4.12E-02	-8.95E-03
122.10	1.09E+00	3.89E-02	1.07E+00	4.48E-02	2.22E-02
165.90	8.97E-01	8.61E-02	1.01E+00	1.41E-01	-1.11E-01
391.70	4.96E-01	1.59E-01	5.88E-01	1.84E-01	-9.22E-02
661.70	4.11E-01	1.69E-02	4.06E-01	1.76E-02	5.12E-03
898.00	3.62E-01	1.35E-01	3.31E-01	1.39E-01	3.10E-02
1173.20	2.75E-01	1.07E-02	2.76E-01	1.08E-02	-1.43E-03
1332.50	2.50E-01	9.75E-03	2.52E-01	9.88E-03	-1.59E-03
1836.10	1.96E-01	1.54E-02	1.92E-01	1.57E-02	3.49E-03

DUAL Efficiency Calibration Equation

Single Equation Terms

Offset :	-9.78E+01	0.00E+00
Slope :	6.11E+01	
Quadratic :	-1.47E+01	
Cubic :	1.55E+00	
4th Order :	-6.13E-02	
5th Order :	0.00E+00	
6th Order :	0.00E+00	
7th Order :	0.00E+00	
8th Order :	0.00E+00	
9th Order :	0.00E+00	

EMPIRICAL Efficiency Calibration Equation

Analysis Report for Efficiency Calibration Sample
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Empirical Equation Terms

Scaling : 9.62E+02
Offset : -5.76E+00
Slope : 6.71E-01
Quadratic : -4.41E-02
Cubic : 1.29E-01
4th Order : -6.13E-02
5th Order : 0.00E+00

LINEAR Efficiency Calibration Equation**Linear Equation Terms**

Offset : -2.29E-04
Slope : -2.34E+00
Quadratic : 6.46E+01
Cubic : 1.29E+03
4th Order : -3.80E+05
5th Order : 0.00E+00
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

PEAK LOCATE REPORT

Peak Locate Performed on : 3/30/2023 2:02:05PM
Peak Locate From Channel : 100
Peak Locate To Channel : 4096
Peak Search Sensitivity : 3.00

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	76.51	142.86	0.2139	4.56
2	87.86	163.84	0.0275	608.39
3	121.91	226.72	0.0464	212.19
4	136.24	253.18	0.1012	46.36
5	165.65	307.50	0.1440	21.04
6	310.40	574.83	0.2459	7.41
7	391.66	724.91	0.2712	5.72
8	510.79	944.94	0.1356	16.22
9	628.29	1161.94	0.1886	11.40
10	661.50	1223.28	0.0212	815.86
11	821.22	1518.28	0.2049	5.85

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
12	897.85	1659.81	0.2411	5.75
13	958.98	1772.72	0.3251	3.73
14	1114.22	2059.44	0.1864	7.62
15	1133.07	2094.25	0.3697	3.02
16	1173.03	2168.05	0.0216	716.52
17	1265.53	2338.90	0.1471	12.21
18	1332.28	2462.18	0.0219	669.39
19	1407.96	2601.97	0.3026	3.02
20	1460.73	2699.44	0.1859	9.63
21	1764.10	3259.75	0.3258	3.18
22	1835.69	3391.98	0.1413	15.46

? = Adjacent peak noted

Errors quoted at 1.000sigma

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EFFICIENCY CALIBRATION REPORT

Detector Name : LYNX 99
Geometry Description : 5 Dram Vial 10 cm.
Efficiency Calibration Performed on : 6/23/2023 12:36:24PM
by : Administrator
Efficiency Type Used : Empirical
Certificate File : 114733 Vial

Efficiency Triplets

Energy	% Efficiency	Error	Computed	Error	% Difference
88.00	1.05E+00	4.41E-02	1.05E+00	4.44E-02	-5.02E-03
122.10	1.33E+00	4.71E-02	1.32E+00	4.91E-02	1.38E-02
165.90	1.25E+00	1.23E-01	1.33E+00	1.47E-01	-8.15E-02
391.70	6.73E-01	3.36E-01	8.82E-01	3.96E-01	-2.08E-01
661.70	6.58E-01	2.70E-02	6.52E-01	2.76E-02	5.65E-03
898.00	4.41E-01	1.84E-01	5.54E-01	2.15E-01	-1.12E-01
1173.20	4.75E-01	1.85E-02	4.77E-01	1.86E-02	-1.85E-03
1332.50	4.40E-01	1.72E-02	4.40E-01	1.71E-02	-2.68E-04
1836.10	3.45E-01	2.93E-02	3.42E-01	2.95E-02	2.81E-03

DUAL Efficiency Calibration Equation

Single Equation Terms

Offset : -1.21E+02 0.00E+00
Slope : 7.60E+01
Quadratic : -1.83E+01
Cubic : 1.94E+00
4th Order : -7.67E-02
5th Order : 0.00E+00
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

EMPIRICAL Efficiency Calibration Equation

Empirical Equation Terms

Scaling : 9.62E+02
Offset : -5.23E+00
Slope : 5.46E-01
Quadratic : -7.61E-02
Cubic : 1.70E-01
4th Order : -7.67E-02
5th Order : 0.00E+00

LINEAR Efficiency Calibration Equation

Linear Equation Terms

Offset : -1.89E-04
Slope : -2.15E+00
Quadratic : 6.46E+01
Cubic : -1.39E+03
4th Order : -2.48E+05
5th Order : 0.00E+00
6th Order : 0.00E+00
7th Order : 0.00E+00
8th Order : 0.00E+00
9th Order : 0.00E+00

PEAK LOCATE REPORT

Peak Locate Performed on : 6/23/2023 12:36:01PM
Peak Locate From Channel : 100
Peak Locate To Channel : 4096
Peak Search Sensitivity : 3.00

Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
1	87.95	176.17	0.0291	461.45
2	121.90	243.99	0.0453	181.60
3	136.27	272.67	0.1055	32.68
4	165.68	331.41	0.1524	14.81
5	309.90	619.42	0.2445	5.36
6	391.72	782.81	0.2638	3.97
7	510.59	1020.18	0.0860	31.56
8	643.13	1284.82	0.1552	10.44
9	661.10	1320.70	0.0141	1221.33
10	686.59	1371.59	0.1583	6.60
11	820.80	1639.55	0.1211	14.39

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Peak No.	Energy (keV)	Centroid Channel	Centroid Uncertainty	Peak Significance
12	897.41	1792.51	0.2565	3.54
13	1111.45	2219.80	0.1594	3.38
14	1140.54	2277.87	0.1507	7.34
15	1172.45	2341.57	0.0133	1090.44
16	1197.61	2391.79	0.1154	10.77
17	1295.02	2586.23	0.1086	14.27
18	1331.67	2659.39	0.0134	1028.60
19	1356.80	2709.56	0.0836	20.24
20	1406.81	2809.39	0.2044	4.12
21	1459.97	2915.48	0.1035	17.24
22	1763.36	3521.01	0.2296	3.29
23	1834.98	3663.95	0.1062	14.38

? = Adjacent peak noted

Errors quoted at 1.000sigma

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