r7022

898 keV:

- σ:

In[1]:=
```
σ = 1.01327;
```

- μ:

In[2]:=
```
μ1 = 897.248;
μ2 = 897.292;
μ3 = 897.420;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[6]=
```
897.32
```

Out[7]=
```
0.08935323161
```

- **Background Area:**

σ

In[8]:=
```
b1 = Integrate[-8.86572 * 10^-6 * x + 6.03554 * 10^-2, {x, μ - σ, μ + σ}]
```

Out[8]=
```
0.1061907206
```

2σ

In[9]:=
```
b2 =
 Integrate[-8.86572 * 10^-6 * x + 6.03554 * 10^-2, {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[9]=
```
0.2123814412
```

3σ

In[10]:=
```
b3 =
 Integrate[-8.86572 * 10^-6 * x + 6.03554 * 10^-2, {x, μ - (3 * σ), μ + (3 * σ)}]
```
Out[10]= 0.3185721617

4σ

In[11]:=
```
b4 =
 Integrate[-8.86572 * 10^-6 * x + 6.03554 * 10^-2, {x, μ - (4 * σ), μ + (4 * σ)}]
```
Out[11]= 0.4247628823

In[12]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```
Out[12]= 0.3185721617

Out[13]= 0.1061907206

- **Signal Area:**

In[14]:=
```
A = 0.3392;
```

σ

In[15]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```
Out[15]= 0.5881582323

2σ

In[16]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```
Out[16]= 0.8223312128

3σ

In[17]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```
Out[17]= 0.8592051475

4σ

In[18]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[18]= 0.8614765343

In[19]:=
```
s = Mean[{s2, s3, s4}]
ds = StandardDeviation[{s2, s3, s4}]
```

Out[19]= 0.8476709649

Out[20]= 0.02197423664

- **SN Ratio**

In[21]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[21]= 3.871954199

Out[22]= 0.06858377713

1836.1 keV:

r7023

898 keV:

- σ:

In[23]:=
```
σ = 0.841905;
```

- μ:

In[24]:=
```
μ1 = 896.811;
μ2 = 896.815;
μ3 = 896.683;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[28]= 896.7696667

Out[29]= 0.0750821772

- **Background Area:**

σ

In[30]:=
```
b1 = Integrate[-1.26053 * 10^-6 * x + 1.15964 * 10^-3, {x, μ - σ, μ + σ}]
```

Out[30]= 0.00004922607098

2σ

In[31]:=
```
b2 =
 Integrate[-1.26053 * 10^-6 * x + 1.15964 * 10^-3, {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[31]= 0.00009845214196

3σ

In[32]:=
```
b3 =
 Integrate[-1.26053 * 10^-6 * x + 1.15964 * 10^-3, {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[32]= 0.0001476782129

4σ

In[33]:=
```
b4 =
 Integrate[-1.26053 * 10^-6 * x + 1.15964 * 10^-3, {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[33]= 0.0001969042839

In[34]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```

Out[34]= 0.0001476782129

Out[35]= 0.00004922607098

- **Signal Area:**

In[36]:=
```
A = 1.965 * 10^3;
```

σ

In[37]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```

Out[37]= 2830.992999

2σ

In[38]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[38]= 3958.142177

3σ

In[39]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[39]= 4135.628176

4σ

In[40]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[40]= 4146.561084

In[41]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[41]= 105.7690034

SN Ratio

In[42]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[42]= $4.020371826 \times 10^{7}$

Out[43]= 3160.491397

1836.1 keV:

r7107

898 keV:

- σ:

In[44]:=
```
σ = 0.818176;
```

- μ:

In[45]:=
```
μ1 = 897.501;
μ2 = 897.497;
μ3 = 897.717;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[49]= 897.5716667

Out[50]= 0.1258782481

- **Background Area:**

σ

In[51]:=
```
b1 = Integrate[-1.21975 * 10^-3 * x + 1.14212, {x, μ - σ, μ + σ}]
```
Out[51]=
```
0.07741083793
```

2σ

In[52]:=
```
b2 = Integrate[-1.21975 * 10^-3 * x + 1.14212, {x, μ - (2 * σ), μ + (2 * σ)}]
```
Out[52]=
```
0.1548216759
```

3σ

In[53]:=
```
b3 = Integrate[-1.21975 * 10^-3 * x + 1.14212, {x, μ - (3 * σ), μ + (3 * σ)}]
```
Out[53]=
```
0.2322325138
```

4σ

In[54]:=
```
b4 = Integrate[-1.21975 * 10^-3 * x + 1.14212, {x, μ - (4 * σ), μ + (4 * σ)}]
```
Out[54]=
```
0.3096433517
```

In[55]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```
Out[55]=
```
0.2322325138
```
Out[56]=
```
0.07741083793
```

- **Signal Area:**

In[57]:=
```
A = 0.2975;
```

σ

In[58]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```
Out[58]=
```
0.4165305482
```

2σ

In[59]:=
$$s2 = A * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, \mu-(2*\sigma), \mu+(2*\sigma)\}\right]$$

Out[59]= 0.582370614

3σ

In[60]:=
$$s3 = A * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, \mu-(3*\sigma), \mu+(3*\sigma)\}\right]$$

Out[60]= 0.6084845394

4σ

In[61]:=
$$s4 = A * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, \mu-(4*\sigma), \mu+(4*\sigma)\}\right]$$

Out[61]= 0.6100931236

In[62]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[62]= 0.01556203812

SN Ratio

In[63]:=
$$\frac{s2}{b2}$$

$$\text{Sqrt}\left[\frac{1}{5}\left((s2-s)^2+(s3-s)^2+(s4-s)^2+(b2-b)^2+(b3-b)^2+(b4-b)^2\right)\right]$$

Out[63]= 3.761557358

Out[64]= 0.1980012771

1836.1 keV:

r7108

898 keV:

- σ:

In[65]:=
```
σ = 0.724023;
```

- μ:

In[66]:=
```
μ1 = 897.601;
μ2 = 897.608;
μ3 = 897.772;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[70]=
```
897.6603333
```

Out[71]=
```
0.09676948555
```

- **Background Area:**

σ

In[72]:=
```
b1 = Integrate[1.6849 * 10^-7 * x - 1.32803 * 10^-4, {x, μ - σ, μ + σ}]
```

Out[72]=
```
0.0000267074557
```

2σ

In[73]:=
```
b2 =
 Integrate[1.6849 * 10^-7 * x - 1.32803 * 10^-4, {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[73]=
```
0.0000534149114
```

3σ

In[74]:=
```
b3 =
 Integrate[1.6849 * 10^-7 * x - 1.32803 * 10^-4, {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[74]=
```
0.00008012236711
```

4σ

In[75]:=
```
b4 =
 Integrate[1.6849 * 10^-7 * x - 1.32803 * 10^-4, {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[75]=
```
0.0001068298228
```

In[76]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```

Out[76]=
```
0.00008012236711
```

Out[77]=
```
0.0000267074557
```

- **Signal Area:**

In[78]:=
```
A = 1.653 * 10^-3;
```

σ

In[79]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```

Out[79]=
```
0.002048039687
```

2σ

In[80]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[80]=
```
0.002863458959
```

3σ

In[81]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[81]=
```
0.002991858558
```

4σ

In[82]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[82]= 0.002999767808

In[83]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[83]= 0.00007651700895

- **SN Ratio**

In[84]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[84]= 53.60785749

Out[85]= 0.6543167348

1836.1 keV:

r7203

898 keV:

- σ:

In[86]:=
```
σ = 0.434416;
```

- μ:

In[87]:=
```
μ1 = 894.748;
μ2 = 894.657;
μ3 = 894.341;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[91]= 894.582

Out[92]= 0.2136141381

- **Background Area:**

σ

In[93]:=
```
b1 = Integrate[6.9465 * 10^-4 * x - 5.81447 * 10^-1, {x, μ - σ, μ + σ}]
```

Out[93]= 0.034731026

2σ

In[94]:=
```
b2 =
 Integrate[6.9465 * 10^-4 * x - 5.81447 * 10^-1, {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[94]= 0.069462052

3σ

In[95]:=
```
b3 =
 Integrate[6.9465 * 10^-4 * x - 5.81447 * 10^-1, {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[95]= 0.104193078

4σ

In[96]:=
```
b4 =
 Integrate[6.9465 * 10^-4 * x - 5.81447 * 10^-1, {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[96]= 0.138924104

In[97]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```

Out[97]= 0.104193078

Out[98]= 0.034731026

- **Signal Area:**

In[99]:=
```
A = 0.434416;
```

σ

In[100]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```

Out[100]= 0.322942183

2σ

In[101]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[101]= 0.4515203944

3σ

In[102]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[102]= 0.4717669001

4σ

In[103]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[103]= 0.4730140587

In[104]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[104]= 0.01206547416

SN Ratio

In[105]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[105]= 6.50024555

Out[106]= 0.2969913891

1836.1 keV:

r7204

898 keV:

- σ:

In[107]:=
```
σ = 0.864761;
```

- μ:

In[108]:=
```
μ1 = 890.828;
μ2 = 890.823;
μ3 = 890.906;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[112]= 890.8523333

Out[113]= 0.0465438861

- **Background Area:**

σ

In[114]:=
```
b1 = Integrate[1.93093 * 10^-6 * x - 1.68461 * 10^-3, {x, μ - σ, μ + σ}]
```
Out[114]=
```
0.00006150784873
```

2σ

In[115]:=
```
b2 =
 Integrate[1.93093 * 10^-6 * x - 1.68461 * 10^-3, {x, μ - (2 * σ), μ + (2 * σ)}]
```
Out[115]=
```
0.0001230156975
```

3σ

In[116]:=
```
b3 =
 Integrate[1.93093 * 10^-6 * x - 1.68461 * 10^-3, {x, μ - (3 * σ), μ + (3 * σ)}]
```
Out[116]=
```
0.0001845235462
```

4σ

In[117]:=
```
b4 =
 Integrate[1.93093 * 10^-6 * x - 1.68461 * 10^-3, {x, μ - (4 * σ), μ + (4 * σ)}]
```
Out[117]=
```
0.0002460313949
```

In[118]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```
Out[118]=
```
0.0001845235462
```
Out[119]=
```
0.00006150784873
```

- **Signal Area:**

In[120]:=
```
A = 7.12002 * 10^-4;
```

σ

In[121]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```
Out[121]=
```
0.001053635659
```

2σ

In[122]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[122]=
```
0.001473136721
```

3σ

In[123]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[123]=
```
0.001539193252
```

4σ

In[124]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[124]=
```
0.001543262249
```

In[125]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[125]=
```
0.00003936498385
```

SN Ratio

In[126]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[126]=
```
11.97519301
```

Out[127]=
```
0.6554268588
```

1836.1 keV:

r7235

898 keV:

- σ:

In[128]:=
```
σ = 0.450241;
```

- μ:

In[129]:=
```
μ1 = 903.233;
μ2 = 903.219;
μ3 = 903.650;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[133]=
```
903.3673333
```

Out[134]=
```
0.2448965768
```

- **Background Area:**

σ

In[135]:=
```
b1 = Integrate[-1.90651 * 10^-4 * x + 0.215972, {x, μ - σ, μ + σ}]
```

Out[135]=
```
0.03939078774
```

2σ

In[136]:=
```
b2 = Integrate[-1.90651 * 10^-4 * x + 0.215972, {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[136]=
```
0.07878157549
```

3σ

In[137]:=
```
b3 = Integrate[-1.90651 * 10^-4 * x + 0.215972, {x, μ - (3 * σ), μ + (3 * σ)}]
```
Out[137]= 0.1181723632

4σ

In[138]:=
```
b4 = Integrate[-1.90651 * 10^-4 * x + 0.215972, {x, μ - (4 * σ), μ + (4 * σ)}]
```
Out[138]= 0.157563151

In[139]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```
Out[139]= 0.1181723632

Out[140]= 0.03939078774

- **Signal Area:**

In[141]:=
```
A = 0.214;
```
σ

In[142]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```
Out[142]= 0.1648815136

2σ

In[143]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```
Out[143]= 0.230528466

3σ

In[144]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```
Out[144]= 0.2408655315

4σ

In[145]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[145]=
```
0.2415022814
```

In[146]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[146]=
```
0.006160154188
```

- **SN Ratio**

In[147]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[147]=
```
2.926172326
```

Out[148]=
```
0.4732063903
```

1836.1 keV:

r7236

898 keV:

- σ:

In[149]:=
```
σ = 3.52758;
```

- μ:

In[150]:=
```
μ1 = 908.429;
μ2 = 908.384;
μ3 = 908.993;
xi = {μ1, μ2, μ3};
μ = Mean[{μ1, μ2, μ3}]
StandardDeviation[{μ1, μ2, μ3}]
```

Out[154]= 908.602

Out[155]= 0.3393626379

- **Background Area:**

σ

In[156]:=
```
b1 = Integrate[3.55421 * 10^-8 * x - 1.49474 * 10^-5, {x, μ - σ, μ + σ}]
```

Out[156]= 0.0001223803797

2σ

In[157]:=
```
b2 =
 Integrate[3.55421 * 10^-8 * x - 1.49474 * 10^-5, {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[157]= 0.0002447607594

3σ

In[158]:=
```
b3 =
 Integrate[3.55421 * 10^-8 * x - 1.49474 * 10^-5, {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[158]= 0.000367141139

4σ

In[159]:=
```
b4 =
 Integrate[3.55421 * 10^-8 * x - 1.49474 * 10^-5, {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[159]= 0.0004895215187

In[160]:=
```
b = Mean[{b2, b3, b4}]
db = StandardDeviation[{b2, b3, b4}]
```

Out[160]= 0.000367141139

Out[161]= 0.0001223803797

- **Signal Area:**

In[162]:=
```
A = 6.80134 * 10^-4;
```

σ

In[163]:=
```
s1 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - σ, μ + σ}]
```

Out[163]= 0.004105674444

2σ

In[164]:=
```
s2 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (2 * σ), μ + (2 * σ)}]
```

Out[164]= 0.005740333229

3σ

In[165]:=
```
s3 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (3 * σ), μ + (3 * σ)}]
```

Out[165]= 0.005997733981

4σ

In[166]:=
```
s4 = A * Integrate[Exp[-1/2 ((x - μ)/σ)^2], {x, μ - (4 * σ), μ + (4 * σ)}]
```

Out[166]= 0.006013589536

In[167]:=
```
ds = StandardDeviation[{s2, s3, s4}]
```

Out[167]= 0.0001533925003

SN Ratio

In[168]:=
```
s2 / b2

Sqrt[1/5 ((s2 - s)^2 + (s3 - s)^2 + (s4 - s)^2 + (b2 - b)^2 + (b3 - b)^2 + (b4 - b)^2)]
```

Out[168]=
```
23.45283306
```

Out[169]=
```
0.6520196598
```

1836.1 keV: