

Gaussian Integral

Integrating over the limits of 2σ

$$\frac{1}{\sigma\sqrt{2\pi}} * \text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$

898 keV:

■ Singles:

r6978

In[2035]:=

```
 $\mu = 897.416;$   
 $\sigma = 1.12141;$   
 $A = 292.5;$ 
```

$$\frac{A}{\sigma\sqrt{2\pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, 893, 900\}\right]$$

Out[2038]=

289.386153

r7022

In[8]:=

```
 $\mu = 897.481;$   
 $\sigma = 0.750439;$   
 $A = 362.7;$ 
```

$$\frac{A}{\sigma\sqrt{2\pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, 895, 899\}\right]$$

Out[11]=

354.7385476

r7107

In[16]:=

```
 $\mu = 897.581;$   
 $\sigma = 1.09091;$   
 $A = 130.5;$ 
```

$$\frac{A}{\sigma\sqrt{2\pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, 895, 900\}\right]$$

Out[19]=

127.5911324

r7203

```
In[20]:=  $\mu = 897.352;$   

 $\sigma = 2.97881;$   

 $A = 17.4328;$   

 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 891, 904\}\right]$ 
```

```
Out[23]= 16.92197572
```

r7235

```
In[28]:=  $\mu = 903.390;$   

 $\sigma = 0.952662;$   

 $A = 81.4;$   

 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 901, 906\}\right]$ 
```

```
Out[31]= 80.65660327
```

■ Coincidence:

r6980

```
In[32]:=  $\mu = 895.417;$   

 $\sigma = 1.19573;$   

 $A = 4132.5;$   

 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 893, 898\}\right]$ 
```

```
Out[35]= 3979.595841
```

r7023

```
In[36]:=  $\mu = 896.893;$   

 $\sigma = 1.00875;$   

 $A = 1232.2;$   

 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 894, 899\}\right]$ 
```

```
Out[39]= 1207.023326
```

r7108

```
In[40]:=  $\mu = 897.483;$   

 $\sigma = 1.24805;$   

 $A = 707.85;$   

 $\frac{A}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 894, 900\}\right]$ 
```

```
Out[43]= 690.5145542
```

r7204

```
In[44]:=  $\mu = 903.99;$   

 $\sigma = 1.06558;$   

 $A = 309;$   

 $\frac{A}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 901, 907\}\right]$ 
```

```
Out[47]= 307.4939284
```

r7236

```
In[48]:=  $\mu = 905.750;$   

 $\sigma = 1.09901;$   

 $A = 519;$   

 $\frac{A}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 903, 908\}\right]$ 
```

```
Out[51]= 505.2544082
```

1836.1 keV:

■ Singles:

r6978

```
In[52]:=  $\mu = 1837.6;$   

 $\sigma = 1.19410;$   

 $A = 185;$   

 $\frac{A}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1835, 1840\}\right]$ 
```

```
Out[55]= 178.1645733
```

r7022

In[56]:= $\mu = 1837.72;$
 $\sigma = 1.28517;$
 $A = 174.2;$
 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1835, 1841\}\right]$

Out[59]= 170.2795254

r7107

In[60]:= $\mu = 1838.56;$
 $\sigma = 1.22172;$
 $A = 71.8;$
 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1836, 1841\}\right]$

Out[63]= 68.85835255

r7203

In[64]:= $\mu = 1839.05;$
 $\sigma = 4.91678;$
 $A = 6.75824;$
 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1829, 1849\}\right]$

Out[67]= 6.474548113

r7235

In[68]:= $\mu = 1850.02;$
 $\sigma = 1.13536;$
 $A = 28.9;$
 $\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1847, 1853\}\right]$

Out[71]= 28.66175831

- **Coincidence:**

r6980

```
In[72]:= 
$$\begin{aligned} &\mu = 1833.39; \\ &\sigma = 1.72362; \\ &A = 2160.9; \\ &\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1829, 1837\}\right] \end{aligned}$$

```

```
Out[75]= 2110.023558
```

r7023

```
In[76]:= 
$$\begin{aligned} &\mu = 1836.02; \\ &\sigma = 1.63517; \\ &A = 515.5; \\ &\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1832, 1840\}\right] \end{aligned}$$

```

```
Out[79]= 508.0544986
```

r7108

```
In[80]:= 
$$\begin{aligned} &\mu = 1838.12; \\ &\sigma = 1.87659; \\ &A = 402; \\ &\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1834, 1842\}\right] \end{aligned}$$

```

```
Out[83]= 388.5713267
```

r7204

```
In[84]:= 
$$\begin{aligned} &\mu = 1824.15; \\ &\sigma = 1.66372; \\ &A = 226.5; \\ &\frac{A}{\sigma \sqrt{2 \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1820, 1828\}\right] \end{aligned}$$

```

```
Out[87]= 222.7311101
```

r7236

In[88]:=

 $\mu = 1854.44;$ $\sigma = 1.94463;$ $A = 379.5;$
$$\frac{A}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 1850, 1859\}\right]$$

Out[91]=

371.63502