

```
In[1]:= c = Log[10-1.7]
```

```
Out[1]= -3.91439
```

```
In[2]:= TeV[x_] := N[Log10[x] + 12]
```

```
In[3]:= flux[x_] := Exp[c x]
```

```
In[4]:= G1[x_, μ_, σ_] := PDF[NormalDistribution[μ, σ], x]
```

```
G[x_, μ_] := G1[x, μ, 0.2]
```

```
G1[x, μ, σ]
```

```
G[x, μ]
```

```
Out[6]= 
$$\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{2\pi}\sigma}$$

```

```
Out[7]= 1.99471 e-12.5 (x-μ)2
```

Distribution of particles with measured energy x

```
In[8]:= Px[x_] := Integrate[G[x, μ] * flux[x], {μ, TeV[1], ∞}]
```

The join distribution

```
In[9]:= joint[x_, μ_] := G[x, μ] * flux[x] / Px[x]
```

Flux of particles with measured energy above 5 TeV whose energy was really above 5 TeV

```
In[10]:= A = NIntegrate[joint[x, μ], {x, TeV[5], ∞}, {μ, TeV[5], ∞}]
```

```
Out[10]= 2.92022
```

The flux of all particles with measured energy above 5 TeV

```
In[11]:= B = NIntegrate[joint[x, μ], {x, TeV[5], ∞}, {μ, TeV[1], ∞}, PrecisionGoal → 12,  
MaxRecursion → 20, Method → {GlobalAdaptive, MaxErrorIncreases → 10 000}]
```

NIntegrate::slwcon :

Numerical integration converging too slowly; suspect one of the following: singularity, value of the integration is 0, highly oscillatory integrand, or WorkingPrecision too small. >>

```
Out[11]= 7.
```

Fraction of particles with measured energy above 5 TeV whose energy was really above 5 TeV

```
In[12]:= A / B
```

```
Out[12]= 0.417174
```