In[45]:=
```
Z = 1
g_e = 2.002
g_p = 5.585
m_e = 9.109 * 10^(-31)
μ_0 = 12.566 * 10^(-7)
μ_B = 927.4 * 10^(-26)
μ_N = 5.050 * 10^(-27)
ϵ_0 = 8.854 * 10^(-12)
ec = 1.602 * 10^(-19)
ħ = 1.054 * 10^(-34)
```

Out[45]= 1

Out[46]= 2.002

Out[47]= 5.585

Out[48]= 9.109×10^{-31}

Out[49]= 1.2566×10^{-6}

Out[50]= 9.274×10^{-24}

Out[51]= 5.05×10^{-27}

Out[52]= 8.854×10^{-12}

Out[53]= 1.602×10^{-19}

Out[54]= 1.054×10^{-34}

In[55]:=
```
ΔE_hf = (2 / 3) * μ_0 * g_e * μ_B * g_p μ_N * (1 / π) * ((m_e * Z * ec^2) / (4 * π * ϵ_0 * ħ^2))^3
```

Out[55]= 9.44707×10^{-25}

In[56]:=
```
ΔE_hf / ec
```

Out[56]= 5.89705×10^{-6}

In[60]:=
```
1240 / (5.8970*^-6)
```

Out[60]= 2.10276×10^{8}

In[61]:=
```
2.1027641*^8 * 10^-9
```

Out[61]= 0.210276

So we have shown that the wavelength is 0.21 m = 21 cm!!!