

```

In[3]:= 12398. / (1 × 10 ^ 8)
Out[3]= 0.00012398

In[4]:= 0.00012398000000000002` * 0.365
Out[4]= 0.0000452527

In[5]:= 12398 * 0.365 × 10 ^ (-8)
Out[5]= 0.0000452527

In[16]:= ΔE1 [z_, n_, l_] := z ^ 2 / n ^ 2 13.605698 (z / 137) ^ 2 / n ^ 2 (3 / 4 - n / (1 + 1 / 2))
In[17]:= ΔE1 [1, 2, 1]
Out[17]= -0.0000264287

In[20]:= ΔE1 [z_, n_, l_] := z ^ 2 / n ^ 2 27.21138505 / 2 (z / 137) ^ 2 / n ^ 2 (3 / 4 - n / (1 + 1 / 2))
In[21]:= ΔE1 [1, 2, 1]
Out[21]= -0.0000264287

In[22]:= 27.21138505 / 2
Out[22]= 13.6057

13.605692525`

In[23]:= ΔE1 [1, 2, 0]
Out[23]= -0.000147246

In[24]:= ΔE1 [1, 3, 0]
Out[24]= -0.0000469844

In[25]:= ΔE1 [1, 3, 1]
Out[25]= -0.0000111868

In[28]:= ΔE21 [z_, n_, l_] := z ^ 2 / n ^ 2 13.605698 (z / 137) ^ 2 1 / (2 n 1 (1 + 1 / 2) (1 + 1))
In[27]:= ΔE22 [z_, n_, l_] := z ^ 2 / n ^ 2 13.605698 (z / 137) ^ 2 (-1 - 1) / (2 n 1 (1 + 1 / 2) (1 + 1))
In[29]:= ΔE21 [1, 2, 1]
Out[29]= 0.0000151021

In[30]:= ΔE22 [1, 2, 1]
Out[30]= -0.0000302043

In[32]:= ΔE3 [z_, n_] := z ^ 2 / n ^ 2 13.605698 (z / 137) ^ 2 / n
In[33]:= ΔE3 [1, 2]
Out[33]= 0.0000906128

In[34]:= ΔE1 [1, 2, 1] + ΔE21 [1, 2, 1]
Out[34]= -0.0000113266

In[35]:= ΔE1 [1, 2, 1] + ΔE22 [1, 2, 1]
Out[35]= -0.000056633

In[36]:= ΔE1 [1, 2, 0] + ΔE3 [1, 2]
Out[36]= -0.000056633

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In[37]:= 0.00005663296095373356` - 0.000011326593406181738`

Out[37]= 0.0000453064

In[62]:= **Dirac** [**Z_**, **n_**, **j_**] := 2 × 13.605698 (137) ^ 2
 (1 / (**Sqrt** [1 + (**Z** / 137 / (**n** - **j** - 1 / 2 + **Sqrt** [(**j** + 1 / 2) ^ 2 - (**Z** / 137) ^ 2])) ^ 2]) - 1)

In[63]:= **Dirac** [1, 1, 1 / 2]

Out[63]= -13.6059

In[49]:= **Dirac** [1, 2, 1 / 2]

Out[49]= -0.425185

In[50]:= **Dirac** [1, 2, 3 / 2]

Out[50]= -0.425179

In[53]:= **Ener** [**Z_**, **n_**] := -**Z** ^ 2 / **n** ^ 2 13.605698

In[54]:= **Ener** [1, 1] + $\Delta E1$ [1, 1, 0] + $\Delta E3$ [1, 1]

Out[54]= -13.6059

In[64]:= **Ener** [1, 1] + $\Delta E1$ [1, 1, 0] + $\Delta E3$ [1, 1] - **Dirac** [1, 1, 1 / 2]

Out[64]= 5.25486×10^{-9}

In[65]:= **Ener** [1, 2] + $\Delta E1$ [1, 2, 0] + $\Delta E3$ [1, 2] - **Dirac** [1, 2, 1 / 2]

Out[65]= 1.59698×10^{-9}

In[57]:= **Ener** [1, 2]

Out[57]= -3.40142

In[58]:= $\Delta E1$ [1, 2, 0]

Out[58]= -0.000147246

In[59]:= $\Delta E3$ [1, 2]

Out[59]= 0.0000906128

In[66]:= **Dirac** [1, 2, 1 / 2]

Out[66]= -3.40148

In[67]:= **Ener** [1, 2] + $\Delta E1$ [1, 2, 1] + $\Delta E21$ [1, 2, 1] - **Dirac** [1, 2, 3 / 2]

Out[67]= 1.17567×10^{-10}

In[68]:= **Ener** [1, 2] + $\Delta E1$ [1, 2, 1] + $\Delta E22$ [1, 2, 1] - **Dirac** [1, 2, 1 / 2]

Out[68]= 1.54837×10^{-9}

In[69]:= **Dirac** [1, 2, 3 / 2] - **Dirac** [1, 2, 1 / 2]

Out[69]= 0.0000453078

In[70]:= $\Delta E21$ [1, 2, 1] - $\Delta E22$ [1, 2, 1]

Out[70]= 0.0000453064

In[71]:= 5.663 - 1.133

Out[71]= 4.53