

Mass defect of $H^2(A)$

$$\frac{d^2\psi}{dr^2} + \frac{2}{r} \frac{d\psi}{dr} + \frac{2m}{\hbar^2} \left(E + \frac{g^2 e^{-\lambda r}}{r} \right) \psi = 0$$

$\lambda r = x : \quad \frac{\psi}{r} = y$

$$\frac{d^2y}{dx^2} + \left(A + B \frac{e^{-x}}{x} \right) y = 0$$

$\frac{ae^{-br}}{br}$
 $a^2 = g^2 \lambda$
 $b = \lambda$

$$\frac{E}{g^2 \lambda} \cdot \frac{g^2}{\lambda} \quad A = \frac{2mE}{\hbar^2 \lambda^2} \quad B = \frac{2m g^2}{\hbar^2 \lambda}$$

$\frac{A}{B}$

$$m \approx \frac{M_p}{2} \approx 1.66 \times 10^{-24} / 2 = 0.83 \times 10^{-24}$$

$$\hbar \approx 1.042 \times 10^{-27}$$

$E \text{ erg} = 1.6 \times 10^{-5} \text{ millivolt}$

$\lambda \text{ cm} = 10^{12} \lambda (10^{-12} \text{ cm})$

$$\frac{2m}{\hbar^2} = \frac{1.66 \times 10^{-24}}{1.08 \times 10^{-54}} = 1.54 \times 10^{30}$$

$108 \overline{) 166} \quad \begin{array}{r} 108 \\ \underline{108} \\ 58 \end{array}$

$$A = \frac{2.64 \times 10^{30} E \text{ millivolt}}{\lambda^2}$$

$$\frac{m c}{\hbar} = \frac{2.7 \times 10^{10}}{1.04} \cdot \frac{10^4}{400}$$

$$\begin{array}{r} 154 \\ \underline{154} \\ 924 \\ \underline{924} \\ 2464 \end{array}$$

$$g = g' e = g' \cdot 4.77 \times 10^{-10}$$

$$B = 1.54 \cdot 10^{30} \times (4.77)^2 \times 10^{-20}$$

$$\frac{e^2}{m c^2} = \frac{(4.77)^2}{9.81} \cdot 10^{-12} = \frac{g}{e}$$

$$= 0.35 \times \frac{g^{12}}{\lambda}$$

4.77	22.76
4.77	1.54
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33.39	91.04
3339	11380
1908	2276
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227629	350504

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