

Table

	$A_{2\pi}$	$A_{\pi p}$ [8]
$r_B$	$(\alpha\mu)^{-1} = (\alpha \frac{m_\pi}{2})^{-1} = 387 \text{ fm}$	$(\alpha\mu)^{-1} = 223 \text{ fm} \quad (\mu = 0.87 m_\pi)$
$E_{1S}^{EH}$	$\frac{1}{4} \alpha^2 m_\pi = 1.86 \text{ keV}$	$\frac{1}{2} \alpha^2 \mu = 3.25 \text{ keV}$
$E_{1S}$	$-E_{1S}^{EH} \frac{4\alpha_{\pi^+\pi^+}}{r_B} \approx -3.5 \text{ eV}$	$-E_{1S}^{EH} \frac{4\alpha_{\pi^+\pi^-}}{r_B} \underbrace{(1+d\epsilon)}_{\text{corr.}} = -7.11 \text{ eV}$
$T_{1S} (Z)$	$\frac{8\pi}{9} \frac{q_0}{\mu} [a_0 - a_2]^2  \psi(0) ^2 \approx 0.2 \text{ eV} \approx 3.3 \mu\text{s}$	$\frac{8\pi}{9} \frac{q_0}{\mu} [a_1 - a_3]^2  \psi(0) ^2 (1+p^{-1}) \approx 1 \text{ eV} (0.80 \text{ eV}) \approx 0.7 \mu\text{s}$
$\psi_{EH}^2(0)$	$\frac{1}{\pi} (\alpha\mu)^3 = \frac{2\mu}{\pi} \frac{E_{1S}^{EH}}{r_B}$	$\frac{1}{\pi} (\alpha\mu)^3 \approx 8.15 \cdot 10^{-8} m_\pi^3$
$a$	$\left\{ \begin{aligned} a_{\pi^+\pi^+} &= \frac{2a_0 + a_2}{3} \approx 0.18 m_\pi^{-1} \\ a_{\pi^+\pi^0} &= \frac{\sqrt{2}}{3} [a_2 - a_0] = -0.12 m_\pi^{-1} \end{aligned} \right.$	$\left\{ \begin{aligned} a_{\pi^+\pi^-} &= \frac{2a_1 + a_3}{3} = 0.09 m_\pi^{-1} \\ a_{\pi^+\pi^0} &= \frac{\sqrt{2}}{3} [a_3 - a_1] = -0.13 m_\pi^{-1} \end{aligned} \right.$
$\rightarrow T_{1S}$	$\rightarrow E_{1S}^{EH} \frac{8q_0}{r_B} [a_{\pi^+\pi^0}]^2$	$\rightarrow E_{1S}^{EH} \frac{8q_0}{r_B} [a_{\pi^+\pi^0}]^2 (1+p^{-1})$
$q_0$	35.6 MeV	28 MeV

$\epsilon^* = \epsilon - \frac{1}{2}\Gamma$