$$M = \begin{pmatrix} -2AS + 12h^2\lambda - 2\mu_h^2 & -2Ah \\ -2Ah & \mu_s^2 \end{pmatrix}$$

$$D = \begin{pmatrix} m_h^2 & \\ & m_s^2 \end{pmatrix} \qquad P = \begin{pmatrix} C_\theta & -S_\theta \\ S_\theta & C_\theta \end{pmatrix}$$

$$P^{-1} \cdot D \cdot P = \begin{pmatrix} C_\theta & S_\theta \\ -S_\theta & C_\theta \end{pmatrix} \begin{pmatrix} m_h^2 & \\ & m_s^2 \end{pmatrix} \begin{pmatrix} C_\theta & -S_\theta \\ S_\theta & C_\theta \end{pmatrix}$$

$$= \begin{pmatrix} C_\theta m_h^2 & S_\theta m_s^2 \\ -S_\theta m_h^2 & C_\theta m_s^2 \end{pmatrix} \begin{pmatrix} C_\theta & -S_\theta \\ S_\theta & C_\theta \end{pmatrix}$$

$$= \begin{pmatrix} C_\theta^2 m_h^2 + S_\theta^2 m_s^2 & -C_\theta S_\theta (m_h^2 - m_s^2) \\ -C_\theta S_\theta (m_h^2 - m_s^2) & S_\theta^2 m_h^2 + C_\theta^2 m_s^2 \end{pmatrix}$$

Compare (1, 2) and (2, 2):

$$\boxed{\begin{aligned} \mu_s^2 &= S_\theta^2 m_h^2 + C_\theta^2 m_s^2 \\ A &= \frac{S_{2\theta}(m_h^2 - m_s^2)}{4v} \end{aligned}}$$

To solve μ_h, take the vev:

$$v^2 = \mu_h^2 \mu_s^2 \cdot \frac{1}{-A^2 + 2\lambda\mu_s^2}, \quad w = \frac{A\mu_h^2}{-A^2 + 2\lambda\mu_s^2} \quad ①$$

and compare (1.1):

$$c_\theta^2 m_h^2 + s_\theta^2 m_s^2 = -2A \cdot \frac{A\mu_h^2}{-A^2 + 2\lambda\mu_s^2} + 12\lambda v^2 - 2\mu_h^2 \quad ②$$

From ①:

$$\mu_h^2 = \frac{v^2(-A^2 + 2\lambda\mu_s^2)}{\mu_s^2} = -\frac{v^2 A^2}{\mu_s^2} + 2\lambda v^2$$

then ②:

$$-2A^2 \frac{v^2}{\mu_s^2} + 12\lambda v^2 + 2\frac{v^2 A^2}{\mu_s^2} - 4\lambda v^2$$

$$= 8\lambda v^2 = c_\theta^2 m_h^2 + s_\theta^2 m_s^2$$

$$\Rightarrow \boxed{\lambda = \frac{c_\theta^2 m_h^2 + s_\theta^2 m_s^2}{8v^2}}$$

Now solve μ_h:

$$2\lambda v^2 = \frac{c_\theta^2 m_h^2 + s_\theta^2 m_s^2}{4}$$

$$-\frac{v^2 A^2}{\mu_s^2} = -\frac{s_{2\theta}^2 (m_h^2 - m_s^2)^2}{16} \frac{1}{s_\theta^2 m_h^2 + c_\theta^2 m_s^2}$$

$$\mu_h^2 = \frac{1}{16(s_\theta^2 m_h^2 + c_\theta^2 m_s^2)}$$

$$\left(4(c_\theta^2 m_h^2 + s_\theta^2 m_s^2)(s_\theta^2 m_h^2 + c_\theta^2 m_s^2) - s_{2\theta}^2 (m_h^2 - m_s^2)^2\right)$$

$$= \frac{\left(s_{2\theta}^2 (m_h^4 + m_s^4) + 4(s_\theta^4 + c_\theta^4) m_h^2 m_s^2 - s_{2\theta}^2 (m_h^4 + m_s^4) + 2 s_{2\theta}^2 m_h^2 m_s^2 \right)}{16(s_\theta^2 m_h^2 + c_\theta^2 m_s^2)}$$

$$= \frac{m_h^2 m_s^2}{8(s_\theta^2 m_h^2 + c_\theta^2 m_s^2)} \left(s_{2\theta}^2 + 2(s_\theta^4 + c_\theta^4) \right)$$

$$s_\theta^4 + c_\theta^4 = \left(\frac{1 - c_{2\theta}}{2}\right)^2 + \left(\frac{1 + c_{2\theta}}{2}\right)^2$$

$$= \frac{1 + c_{2\theta}^2 - 2c_{2\theta}}{4} + \frac{1 + c_{2\theta}^2 + 2c_{2\theta}}{4} = \frac{1 + c_{2\theta}^2}{2}$$

$$S_{2\theta}^2 + (1 + C_{2\theta}^2) = 2$$

$$\Rightarrow \boxed{\mu_n^2 = \frac{m_n^2 m_s^2}{4(S_\theta^2 m_n^2 + C_\theta^2 m_s^2)}}$$