In[222]:= **Mneut[[Range[8, 14], 8]] // Simplify // MatrixForm**

Out[222]//MatrixForm=

$$\begin{pmatrix} \frac{1}{4} \left(4 \, \text{mH1}^2 + \text{g2}^2 \, \text{v1}^2 - \text{g2}^2 \, \text{v2}^2 + 4 \, \text{v2}^2 \, \kappa 0^2 + 4 \, \kappa 0^2 \, \sigma S^2 + \text{g2}^2 \, \sigma v[1]^2 + \text{g2}^2 \, \sigma v[2]^2 + \text{g2}^2 \, \sigma v[3]^2 + \text{g1}^2 \, \left(\text{v1}^2 - \text{v2}^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) \right) \\ \frac{1}{2} \left(2 \, \text{A0} \, \sigma S + \kappa 0 \, \kappa 3 \, \sigma S^2 + \kappa 0 \, \kappa 2 \, \sigma n[3]^2 \right) \\ \text{A0} \, \text{v2} + \kappa 0 \, \left(-\text{v2} \, \kappa 3 \, \sigma S + \sigma n[3] \, \left(\kappa 1[1] \, \sigma v[1] + \kappa 1[2] \, \sigma v[2] + \kappa 1[3] \, \sigma v[3] \right) \right) \\ -\kappa 0 \, \sigma S \, \kappa 1[1] \, \sigma n[3] \\ -\kappa 0 \, \sigma S \, \kappa 1[2] \, \sigma n[3] \\ -\kappa 0 \, \sigma S \, \kappa 1[3] \, \sigma n[3] \\ \kappa 0 \, \left(\text{v2} \, \kappa 2 \, \sigma n[3] + \sigma S \, \left(\kappa 1[1] \, \sigma v[1] + \kappa 1[2] \, \sigma v[2] + \kappa 1[3] \, \sigma v[3] \right) \right) \end{pmatrix}$$

In[223]:= **Mneut[[Range[8, 14], 9]] // Simplify // MatrixForm**

Out[223]//MatrixForm=

$$\begin{pmatrix} \frac{1}{2} \left(2 \, \text{A0} \, \sigma S + \kappa 0 \, \kappa 3 \, \sigma S^2 + \kappa 0 \, \kappa 2 \, \sigma n[3]^2 \right) \\ \frac{1}{4} \left(4 \, \text{mH2}^2 - \text{g2}^2 \, \text{v1}^2 + \text{g2}^2 \, \text{v2}^2 + 4 \, \text{v1}^2 \, \kappa 0^2 + 4 \, \kappa 0^2 \, \sigma S^2 + 4 \, \kappa 1[1]^2 \, \sigma n[3]^2 + 4 \, \kappa 1[2]^2 \, \sigma n[3]^2 + 4 \, \kappa 1[3]^2 \, \sigma n[3]^2 - \text{g2}^2 \, \sigma v[1]^2 + 4 \, \kappa 1[1]^2 \, \sigma v[1]^2 + 8 \, \kappa 1[1] \, \kappa 1[2] \, \sigma v[1] \, \sigma v[2] \\ \text{A0} \, \text{v1} - \text{v1} \, \kappa 0 \, \kappa 3 \, \sigma S + \kappa 2 \, \sigma n[3] \, \left(\kappa 1[1] \, \sigma v[1] + \kappa 1[2] \, \sigma v[2] + \kappa 1[3] \, \sigma v[3] \right) \\ -\left(\text{A1}[1] + \kappa 2 \, \sigma S \, \kappa 1[1] \right) \, \sigma n[3] \\ -\left(\text{A1}[2] + \kappa 2 \, \sigma S \, \kappa 1[2] \right) \, \sigma n[3] \\ -\left(\text{A1}[3] + \kappa 2 \, \sigma S \, \kappa 1[3] \right) \, \sigma n[3] \\ \text{v1} \, \kappa 0 \, \kappa 2 \, \sigma n[3] + \text{A1}[1] \, \sigma v[1] - \kappa 2 \, \sigma S \, \kappa 1[1] \, \sigma v[1] + \text{A1}[2] \, \sigma v[2] - \kappa 2 \, \sigma S \, \kappa 1[2] \, \sigma v[2] + \text{A1}[3] \, \sigma v[3] - \kappa 2 \, \sigma S \, \kappa 1[3] \, \sigma v[3] \end{pmatrix}$$

In[224]:= **Mneut[[Range[8, 14], 10]] // Simplify // MatrixForm**

Out[224]//MatrixForm=

$$\begin{pmatrix} \text{A0} \, \text{v2} + \kappa 0 \, \left(-\text{v2} \, \kappa 3 \, \sigma S + \sigma n[3] \, \left(\kappa 1[1] \, \sigma v[1] + \kappa 1[2] \, \sigma v[2] + \kappa 1[3] \, \sigma v[3] \right) \right) \\ \text{A0} \, \text{v1} - \text{v1} \, \kappa 0 \, \kappa 3 \, \sigma S + \kappa 2 \, \sigma n[3] \, \left(\kappa 1[1] \, \sigma v[1] + \kappa 1[2] \, \sigma v[2] + \kappa 1[3] \, \sigma v[3] \right) \\ \text{MS}^2 + \text{v1}^2 \, \kappa 0^2 + \text{v2}^2 \, \kappa 0^2 + \text{v1} \, \text{v2} \, \kappa 0 \, \kappa 3 - \text{A3} \, \sigma S + \frac{\kappa 3^2 \, \sigma S^2}{2} + \kappa 2^2 \, \sigma n[3]^2 - \frac{1}{2} \, \kappa 2 \, \kappa 3 \, \sigma n[3]^2 \\ \left(-\text{v1} \, \kappa 0 + \text{v2} \, \kappa 2 \right) \, \kappa 1[1] \, \sigma n[3] \\ \left(-\text{v1} \, \kappa 0 + \text{v2} \, \kappa 2 \right) \, \kappa 1[2] \, \sigma n[3] \\ \left(-\text{v1} \, \kappa 0 + \text{v2} \, \kappa 2 \right) \, \kappa 1[3] \, \sigma n[3] \\ \text{A2} \, \sigma n[3] + \text{v1} \, \kappa 0 \, \left(\kappa 1[1] \, \sigma v[1] + \kappa 1[2] \, \sigma v[2] + \kappa 1[3] \, \sigma v[3] \right) + \kappa 2 \, \left(-\kappa 3 \, \sigma S \, \sigma n[3] + \text{v2} \, \kappa 1[1] \, \sigma v[1] + \text{v2} \, \kappa 1[2] \, \sigma v[2] + \text{v2} \, \kappa 1[3] \, \sigma v[3] \right) \end{pmatrix}$$

In[225]:= **Mneut[[Range[8, 14], 11]] // Simplify // MatrixForm**

Out[225]//MatrixForm=

$$
\begin{pmatrix}
-\kappa 0 \, \sigma S \, \kappa 1[1] \, \sigma n[3] \\
-(A1[1] + \kappa 2 \, \sigma S \, \kappa 1[1]) \, \sigma n[3] \\
(-v1 \, \kappa 0 + v2 \, \kappa 2) \, \kappa 1[1] \, \sigma n[3] \\
\frac{1}{4} \left(4 \left(ML[1, 1]^2 + \kappa 1[1]^2 \left(v2^2 + \sigma n[3]^2 \right) \right) + g1^2 \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) + g2^2 \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) \right) \\
ML[1, 2]^2 + \kappa 1[1] \, \kappa 1[2] \left(v2^2 + \sigma n[3]^2 \right) \\
ML[1, 3]^2 + \kappa 1[1] \, \kappa 1[3] \left(v2^2 + \sigma n[3]^2 \right) \\
-v1 \, \kappa 0 \, \sigma S \, \kappa 1[1] + v2 \, (A1[1] - \kappa 2 \, \sigma S \, \kappa 1[1])
\end{pmatrix}
$$

In[226]:= **Mneut[[Range[8, 14], 12]] // Simplify // MatrixForm**

Out[226]//MatrixForm=

$$
\begin{pmatrix}
-\kappa 0 \, \sigma S \, \kappa 1[2] \, \sigma n[3] \\
-(A1[2] + \kappa 2 \, \sigma S \, \kappa 1[2]) \, \sigma n[3] \\
(-v1 \, \kappa 0 + v2 \, \kappa 2) \, \kappa 1[2] \, \sigma n[3] \\
ML[1, 2]^2 + \kappa 1[1] \, \kappa 1[2] \left(v2^2 + \sigma n[3]^2 \right) \\
\frac{1}{4} \left(4 \left(ML[2, 2]^2 + \kappa 1[2]^2 \left(v2^2 + \sigma n[3]^2 \right) \right) + g1^2 \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) + g2^2 \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) \right) \\
ML[2, 3]^2 + \kappa 1[2] \, \kappa 1[3] \left(v2^2 + \sigma n[3]^2 \right) \\
-v1 \, \kappa 0 \, \sigma S \, \kappa 1[2] + v2 \, (A1[2] - \kappa 2 \, \sigma S \, \kappa 1[2])
\end{pmatrix}
$$

In[227]:= **Mneut[[Range[8, 14], 13]] // Simplify // MatrixForm**

Out[227]//MatrixForm=

$$
\begin{pmatrix}
-\kappa 0 \, \sigma S \, \kappa 1[3] \, \sigma n[3] \\
-(A1[3] + \kappa 2 \, \sigma S \, \kappa 1[3]) \, \sigma n[3] \\
(-v1 \, \kappa 0 + v2 \, \kappa 2) \, \kappa 1[3] \, \sigma n[3] \\
ML[1, 3]^2 + \kappa 1[1] \, \kappa 1[3] \left(v2^2 + \sigma n[3]^2 \right) \\
ML[2, 3]^2 + \kappa 1[2] \, \kappa 1[3] \left(v2^2 + \sigma n[3]^2 \right) \\
\frac{1}{4} \left(4 \left(ML[3, 3]^2 + \kappa 1[3]^2 \left(v2^2 + \sigma n[3]^2 \right) \right) + g1^2 \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) + g2^2 \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2 \right) \right) \\
-v1 \, \kappa 0 \, \sigma S \, \kappa 1[3] + v2 \, (A1[3] - \kappa 2 \, \sigma S \, \kappa 1[3])
\end{pmatrix}
$$

In[228]:= **Mneut[[Range[8, 14], 14]] // Simplify // MatrixForm**

Out[228]//MatrixForm=

$\kappa 0 \ (\text{v2} \ \kappa 2 \ \sigma n[3] + \sigma S \ (\kappa 1[1] \ \sigma v[1] + \kappa 1[2] \ \sigma v[2] + \kappa 1[3] \ \sigma v[3]))$

$\text{v1} \ \kappa 0 \ \kappa 2 \ \sigma n[3] + \text{A1}[1] \ \sigma v[1] - \kappa 2 \ \sigma S \ \kappa 1[1] \ \sigma v[1] + \text{A1}[2] \ \sigma v[2] - \kappa 2 \ \sigma S \ \kappa 1[2] \ \sigma v[2] + \text{A1}[3] \ \sigma v[3] - \kappa 2 \ \sigma S \ \kappa 1[3] \ \sigma v[3]$

$\text{A2} \ \sigma n[3] + \text{v1} \ \kappa 0 \ (\kappa 1[1] \ \sigma v[1] + \kappa 1[2] \ \sigma v[2] + \kappa 1[3] \ \sigma v[3]) + \kappa 2 \ (-\kappa 3 \ \sigma S \ \sigma n[3] + \text{v2} \ \kappa 1[1] \ \sigma v[1] + \text{v2} \ \kappa 1[2] \ \sigma v[2] + \text{v2} \ \kappa 1[3] \ \sigma v[3])$

$-\text{v1} \ \kappa 0 \ \sigma S \ \kappa 1[1] + \text{v2} \ (\text{A1}[1] - \kappa 2 \ \sigma S \ \kappa 1[1])$

$-\text{v1} \ \kappa 0 \ \sigma S \ \kappa 1[2] + \text{v2} \ (\text{A1}[2] - \kappa 2 \ \sigma S \ \kappa 1[2])$

$-\text{v1} \ \kappa 0 \ \sigma S \ \kappa 1[3] + \text{v2} \ (\text{A1}[3] - \kappa 2 \ \sigma S \ \kappa 1[3])$

$\text{v1} \ \text{v2} \ \kappa 0 \ \kappa 2 - \text{A2} \ \sigma S + \kappa 2^2 \ \sigma S^2 - \frac{1}{2} \ \kappa 2 \ \kappa 3 \ \sigma S^2 + \text{MN}[3, 3]^2 + \text{v2}^2 \ \kappa 1[1]^2 + \text{v2}^2 \ \kappa 1[2]^2 + \text{v2}^2 \ \kappa 1[3]^2 + \frac{1}{2} \ \kappa 2^2 \ \sigma n[3]^2 + \kappa 1[1]^2 \ \sigma v[1]^2 + 2 \ \kappa 1[1] \ \kappa 1[2] \ \sigma v[1] \ \sigma v[2] + \kappa 1[2]^2 \ \sigma$