In[229]:= **Mchar[[Range[1, 6], 1]] // Simplify // MatrixForm**

Out[229]//MatrixForm=

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

In[230]:= **Mchar[[Range[1, 6], 2]] // Simplify // MatrixForm**

Out[230]//MatrixForm=

$$\begin{pmatrix} \frac{1}{2}\left(\text{g2}^2\,\text{v1}\,\text{v2}-2\,\text{v1}\,\text{v2}\,\kappa 0^2+2\,\text{A0}\,\sigma\text{S}+\kappa 0\,\kappa 3\,\sigma\text{S}^2+\kappa 0\,\kappa 2\,\sigma\text{n}[3]^2\right) \\ \frac{1}{4}\left(4\,\text{mH2}^2+\text{g2}^2\,\text{v1}^2+\text{g2}^2\,\text{v2}^2+4\,\kappa 0^2\,\sigma\text{S}^2+4\,\kappa 1[1]^2\,\sigma\text{n}[3]^2+4\,\kappa 1[2]^2\,\sigma\text{n}[3]^2+4\,\kappa 1[3]^2\,\sigma\text{n}[3]^2+\text{g2}^2\,\sigma v[1]^2+\text{g2}^2\,\sigma v[2]^2+\text{g2}^2\,\sigma v[3]^2-\text{g1}^2\left(\text{v1}^2-\text{v2}^2+\sigma v[1]^2+\sigma v[\right. \\ -\text{A1}[1]\,\sigma\text{n}[3]+\frac{1}{2}\,\text{g2}^2\,\text{v2}\,\sigma v[1]-\kappa 1[1]\,(\kappa 2\,\sigma\text{S}\,\sigma\text{n}[3]+\text{v2}\,(\kappa 1[1]\,\sigma v[1]+\kappa 1[2]\,\sigma v[2]+\kappa 1[3]\,\sigma v[3])) \\ -\text{A1}[2]\,\sigma\text{n}[3]+\frac{1}{2}\,\text{g2}^2\,\text{v2}\,\sigma v[2]-\kappa 1[2]\,(\kappa 2\,\sigma\text{S}\,\sigma\text{n}[3]+\text{v2}\,(\kappa 1[1]\,\sigma v[1]+\kappa 1[2]\,\sigma v[2]+\kappa 1[3]\,\sigma v[3])) \\ -\text{A1}[3]\,\sigma\text{n}[3]+\frac{1}{2}\,\text{g2}^2\,\text{v2}\,\sigma v[3]-\kappa 1[3]\,(\kappa 2\,\sigma\text{S}\,\sigma\text{n}[3]+\text{v2}\,(\kappa 1[1]\,\sigma v[1]+\kappa 1[2]\,\sigma v[2]+\kappa 1[3]\,\sigma v[3])) \\ -\text{Y}\tau\,(\text{v1}\,\kappa 1[3]\,\sigma\text{n}[3]+\kappa 0\,\sigma\text{S}\,\sigma v[3]) \end{pmatrix}$$

In[231]:= **Mchar[[Range[1, 6], 3]] // Simplify // MatrixForm**

Out[231]//MatrixForm=

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

In[232]:=
```
Mchar[[Range[1, 6], 4]] // Simplify // MatrixForm
```

Out[232]//MatrixForm=

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

In[233]:=
```
Mchar[[Range[1, 6], 5]] // Simplify // MatrixForm
```

Out[233]//MatrixForm=

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

In[234]:=
```
Mchar[[Range[1, 6], 6]] // Simplify // MatrixForm
```

Out[234]//MatrixForm=

$$\begin{pmatrix} -v2\, Y\tau\, \kappa 1[3]\, \sigma n[3] - A\tau\, \sigma v[3] \\ -Y\tau\, (v1\, \kappa 1[3]\, \sigma n[3] + \kappa 0\, \sigma S\, \sigma v[3]) \\ 0 \\ 0 \\ A\tau\, v1 - v2\, Y\tau\, \kappa 0\, \sigma S \\ v1^2\, Y\tau^2 + ME[3, 3]^2 + Y\tau^2\, \sigma v[3]^2 - \frac{1}{2}\, g1^2\, \left(v1^2 - v2^2 + \sigma v[1]^2 + \sigma v[2]^2 + \sigma v[3]^2\right) \end{pmatrix}$$