$$H_{51} = \begin{bmatrix} -2\,h - 6\,\mu & 0 & 0 & -\mathbf{i}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{\sqrt{2}} \\ 0 & -2\,h - 6\,\mu + U & \mathbf{i}\,\sqrt{\frac{3}{2}}\,t - \frac{t}{\sqrt{2}} & 0 \\ 0 & -\mathbf{i}\,\sqrt{\frac{3}{2}}\,t - \frac{t}{\sqrt{2}} & -2\,h - 6\,\mu + U & \frac{-t}{2} + \frac{\mathbf{i}}{2}\,\sqrt{3}\,t \\ \mathbf{i}\,\sqrt{\frac{3}{2}}\,t + \frac{t}{\sqrt{2}} & 0 & \frac{-t}{2} - \frac{\mathbf{i}}{2}\,\sqrt{3}\,t & -2\,h - 6\,\mu + U \end{bmatrix}$$