$$H_{111} = \begin{bmatrix} -6\,\mu + 2\,U & \frac{-t}{2} + \frac{\mathbf{i}}{2}\sqrt{3}\,t & \sqrt{2}\,t & 0 \\ \frac{-t}{2} - \frac{\mathbf{i}}{2}\sqrt{3}\,t & -6\,\mu + 2\,U & 0 & \sqrt{2}\,t \\ \sqrt{2}\,t & 0 & -6\,\mu + 2\,U & 0 \\ 0 & \sqrt{2}\,t & 0 & -6\,\mu + 3\,U \end{bmatrix}$$