$$
K_{109}^{2} \quad = \quad \left[\begin{array}{cccccccccccccc}
\frac{-27\,U}{4\,t} & \frac{\frac{3}{8}\,\mathbf{i}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{t} & 0 & \frac{3\,\left(1+\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 4+\frac{U^2}{4\,t^2} & \frac{\frac{1}{4}\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & 0 & \frac{\frac{1}{2}\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & \frac{\sqrt{3}\,U^2}{4\,t^2} & \frac{-\left(\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U^2\right)}{4\,\sqrt{2}\,t^2} & \frac{\frac{-3}{4}\,\mathbf{i}\,U}{t} & \frac{3\,\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U}{8\,t} & 0 & \frac{-\left(\left(3\,\mathbf{i}+\sqrt{3}\right)\,U\right)}{2\,\sqrt{2}\,t} \\
\frac{\frac{-3}{8}\,\mathbf{i}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U}{t} & \frac{-25\,U}{4\,t} & \frac{8\,t^2+\left(-1-3\,\mathbf{i}\,\sqrt{3}\right)\,U^2}{8\,t^2} & \frac{3\,\left(1-\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 0 & 0 & 0 & 0 & -3\,\mathbf{i}-\sqrt{3} & 0 & \frac{-3\,\left(-\mathbf{i}+\sqrt{3}\right)\,U}{8\,t} & \frac{-\left(\sqrt{3}\,U\right)}{4\,t} & \frac{-8\,\sqrt{3}\,t^2+\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{8\,t^2} & 0 \\
0 & \frac{8\,t^2+\left(-1+3\,\mathbf{i}\,\sqrt{3}\right)\,U^2}{8\,t^2} & \frac{-21\,U}{4\,t} & \frac{\frac{-\mathbf{i}}{4}\,\left(-5\,\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{-3\,U}{4\,t} & 0 & \frac{\left(-1+3\,\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 0 & \frac{-3\,\sqrt{3}\,U}{4\,t} & \frac{\sqrt{\frac{3}{2}}\,U}{t} & -3\,\mathbf{i}-\sqrt{3} & \frac{8\,\sqrt{3}\,t^2+\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{8\,t^2} & \frac{-\left(\left(3\,\mathbf{i}+4\,\sqrt{3}\right)\,U\right)}{4\,t} & \frac{-\left(\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2\right)}{4\,\sqrt{2}\,t^2} \\
\frac{3\,\left(1-\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & \frac{3\,\left(1+\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & \frac{\frac{1}{4}\,\left(5\,\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{-6\,U}{t} & 0 & \frac{-3\,\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right) & 1+\mathbf{i}\,\sqrt{3} & 0 & 0 & \frac{3\,\mathbf{i}+\sqrt{3}}{2} & 0 & 0 & \frac{-\left(\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U^2\right)}{4\,\sqrt{2}\,t^2} & 0 \\
4+\frac{U^2}{4\,t^2} & 0 & \frac{-3\,U}{4\,t} & 0 & \frac{-17\,U}{4\,t} & \frac{3\,\left(1-\mathbf{i}\,\sqrt{3}\right)\,U}{4\,\sqrt{2}\,t} & 0 & 0 & \frac{-3\,\sqrt{3}\,U}{4\,t} & \frac{-\left(\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U\right)}{4\,\sqrt{2}\,t} & \frac{\frac{3}{4}\,\mathbf{i}\,U^2}{t^2} & 0 & \frac{\frac{-3}{4}\,\mathbf{i}\,U}{t} & 0 \\
\frac{\frac{-\mathbf{i}}{4}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & 0 & 0 & \frac{3}{2}\,\mathbf{i}\,\left(\mathbf{i}+\sqrt{3}\right) & \frac{3\,\left(1+\mathbf{i}\,\sqrt{3}\right)\,U}{4\,\sqrt{2}\,t} & \frac{-6\,U}{t} & 0 & -2 & \frac{-\left(\left(3\,\mathbf{i}+\sqrt{3}\right)\,U\right)}{4\,\sqrt{2}\,t} & -\left(\frac{\sqrt{3}\,U}{t}\right) & \frac{-3\,\left(-\mathbf{i}+\sqrt{3}\right)\,U^2}{4\,\sqrt{2}\,t^2} & 0 & 0 & \frac{3\,\mathbf{i}-\sqrt{3}}{2} \\
0 & 0 & \frac{\left(-1-3\,\mathbf{i}\,\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 1-\mathbf{i}\,\sqrt{3} & 0 & 0 & \frac{-5\,U}{t} & 0 & 0 & 0 & 0 & 0 & \frac{\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 3\,\mathbf{i}-\sqrt{3} \\
\frac{\frac{-\mathbf{i}}{2}\,\left(-\mathbf{i}+\sqrt{3}\right)\,U}{\sqrt{2}\,t} & 0 & 0 & 0 & 0 & -2 & 0 & \frac{-4\,U}{t} & 0 & -2\,\sqrt{3} & \frac{-3\,\left(-\mathbf{i}+\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 0 & 0 & 0 \\
\frac{\sqrt{3}\,U^2}{4\,t^2} & 3\,\mathbf{i}-\sqrt{3} & \frac{-3\,\sqrt{3}\,U}{4\,t} & 0 & \frac{-3\,\sqrt{3}\,U}{4\,t} & \frac{-\left(\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U\right)}{4\,\sqrt{2}\,t} & 0 & 0 & \frac{-15\,U}{4\,t} & \frac{5\,\left(1-\mathbf{i}\,\sqrt{3}\right)\,U}{4\,\sqrt{2}\,t} & \frac{\frac{-\mathbf{i}}{4}\,\sqrt{3}\,U^2}{t^2} & 1-\mathbf{i}\,\sqrt{3} & \frac{\frac{-3}{4}\,\mathbf{i}\,\sqrt{3}\,U}{t} & 0 \\
\frac{-\left(\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2\right)}{4\,\sqrt{2}\,t^2} & 0 & \frac{\sqrt{\frac{3}{2}}\,U}{t} & \frac{-3\,\mathbf{i}+\sqrt{3}}{2} & \frac{-\left(\left(3\,\mathbf{i}+\sqrt{3}\right)\,U\right)}{4\,\sqrt{2}\,t} & -\left(\frac{\sqrt{3}\,U}{t}\right) & 0 & -2\,\sqrt{3} & \frac{5\,\left(1+\mathbf{i}\,\sqrt{3}\right)\,U}{4\,\sqrt{2}\,t} & \frac{-4\,U}{t} & \frac{\left(3-\mathbf{i}\,\sqrt{3}\right)\,U^2}{4\,\sqrt{2}\,t^2} & 0 & \frac{-3\,U}{\sqrt{2}\,t} & \frac{1-\mathbf{i}\,\sqrt{3}}{2} \\
\frac{\frac{3}{4}\,\mathbf{i}\,U}{t} & \frac{-3\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{8\,t} & 3\,\mathbf{i}-\sqrt{3} & 0 & \frac{\frac{-3}{4}\,\mathbf{i}\,U^2}{t^2} & \frac{-3\,\left(\mathbf{i}+\sqrt{3}\right)\,U^2}{4\,\sqrt{2}\,t^2} & 0 & \frac{-3\,\left(\mathbf{i}+\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & \frac{\mathbf{i}}{4}\,\sqrt{3}\,U^2 & \frac{\left(3+\mathbf{i}\,\sqrt{3}\right)\,U^2}{4\,\sqrt{2}\,t^2} & \frac{-11\,U}{4\,t} & \frac{3\,\left(3+\mathbf{i}\,\sqrt{3}\right)\,U}{8\,t} & -1+\mathbf{i}\,\sqrt{3} & 0 \\
\frac{3\,\left(3\,\mathbf{i}+\sqrt{3}\right)\,U}{8\,t} & \frac{-\left(\sqrt{3}\,U\right)}{4\,t} & \frac{8\,\sqrt{3}\,t^2+\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{8\,t^2} & 0 & 0 & 0 & 0 & 0 & 1+\mathbf{i}\,\sqrt{3} & 0 & \frac{3\,\left(3-\mathbf{i}\,\sqrt{3}\right)\,U}{8\,t} & \frac{-15\,U}{4\,t} & \frac{-\left(24\,t^2+\left(3+\mathbf{i}\,\sqrt{3}\right)\,U^2\right)}{8\,t^2} & \frac{\sqrt{2}\,U-\mathbf{i}\,\sqrt{6}\,U}{4\,t} \\
0 & \frac{-8\,\sqrt{3}\,t^2+\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{8\,t^2} & \frac{\left(3\,\mathbf{i}-4\,\sqrt{3}\right)\,U}{4\,t} & \frac{-\left(\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2\right)}{4\,\sqrt{2}\,t^2} & \frac{\frac{3}{4}\,\mathbf{i}\,U}{t} & 0 & \frac{\left(3\,\mathbf{i}+\sqrt{3}\right)\,U}{2\,\sqrt{2}\,t} & 0 & \frac{\frac{3}{4}\,\mathbf{i}\,\sqrt{3}\,U}{t} & \frac{-3\,U}{\sqrt{2}\,t} & -1-\mathbf{i}\,\sqrt{3} & \frac{-24\,t^2+\mathbf{i}\,\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{8\,t^2} & \frac{-13\,U}{4\,t} & \frac{\mathbf{i}}{4}\,\left(3\,\mathbf{i}+\sqrt{3}\right)\,U^2 \\
\frac{-\left(\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U\right)}{2\,\sqrt{2}\,t} & 0 & \frac{-\left(\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U^2\right)}{4\,\sqrt{2}\,t^2} & 0 & 0 & \frac{-3\,\mathbf{i}-\sqrt{3}}{2} & -3\,\mathbf{i}-\sqrt{3} & 0 & 0 & \frac{1+\mathbf{i}\,\sqrt{3}}{2} & 0 & \frac{\sqrt{2}\,U+\mathbf{i}\,\sqrt{6}\,U}{4\,t} & \frac{\frac{-\mathbf{i}}{4}\,\left(-3\,\mathbf{i}+\sqrt{3}\right)\,U^2}{\sqrt{2}\,t^2} & \frac{-2\,U}{t}
\end{array}\right]
$$