

$\langle 4, 4, 4 \rangle$ decomposition of AB (48 multiplications)

$$\begin{aligned}
M_0 &= \left(-\frac{B_{0,0}}{2} - \frac{B_{1,0}}{2} + \frac{B_{2,0}}{2} - \frac{iB_{3,0}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,1} \right. \\
&\quad \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,1} \right) \\
M_1 &= \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,3}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,3}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,3}}{2} + \frac{B_{3,1}}{2} + \frac{B_{3,3}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,3} \right. \\
&\quad \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right) \\
M_2 &= \left(\left(\frac{1}{2} + \frac{i}{2} \right) B_{0,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) B_{1,1} + \left(\frac{1}{2} + \frac{i}{2} \right) B_{2,1} + \left(\frac{1}{2} - \frac{i}{2} \right) B_{3,1} \right) \left(-\frac{A_{0,1}}{2} + \frac{A_{0,2}}{2} - \frac{iA_{1,1}}{2} \right. \\
&\quad \left. + \frac{iA_{1,2}}{2} + \frac{iA_{2,1}}{2} - \frac{iA_{2,2}}{2} - \frac{iA_{3,1}}{2} + \frac{iA_{3,2}}{2} \right) \\
M_3 &= \left(-\frac{iB_{0,0}}{2} + \frac{iB_{0,2}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{1,2}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,2}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,2}}{2} \right) \left(-\frac{iA_{0,0}}{2} - \frac{A_{0,1}}{2} + \frac{A_{0,2}}{2} - \frac{A_{0,3}}{2} \right. \\
&\quad \left. + \frac{iA_{1,0}}{2} - \frac{A_{1,1}}{2} + \frac{A_{1,2}}{2} + \frac{A_{1,3}}{2} - \frac{iA_{2,0}}{2} - \frac{A_{2,1}}{2} + \frac{A_{2,2}}{2} - \frac{A_{2,3}}{2} - \frac{A_{3,0}}{2} - \frac{iA_{3,1}}{2} + \frac{iA_{3,2}}{2} + \frac{iA_{3,3}}{2} \right) \\
M_4 &= \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,0} \right. \\
&\quad \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,1} \right) \left(-\frac{B_{0,0}}{2} + \frac{B_{0,2}}{2} + \frac{B_{0,3}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,2}}{2} - \frac{B_{1,3}}{2} \right. \\
&\quad \left. + \frac{B_{2,0}}{2} - \frac{B_{2,2}}{2} - \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,2}}{2} - \frac{iB_{3,3}}{2} \right) \\
M_5 &= \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} \right. \\
&\quad \left. + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right) \left(\frac{B_{0,1}}{2} + \frac{B_{0,3}}{2} + \frac{B_{1,1}}{2} + \frac{B_{1,3}}{2} + \frac{B_{2,1}}{2} + \frac{B_{2,3}}{2} + \frac{iB_{3,1}}{2} + \frac{iB_{3,3}}{2} \right) \\
M_6 &= \left(\left(-\frac{1}{2} - \frac{i}{2} \right) B_{0,1} + \left(\frac{1}{2} + \frac{i}{2} \right) B_{1,1} + \left(\frac{1}{2} + \frac{i}{2} \right) B_{2,1} + \left(\frac{1}{2} - \frac{i}{2} \right) B_{3,1} \right) \left(\frac{iA_{0,0}}{2} + \frac{A_{0,3}}{2} - \frac{A_{1,0}}{2} + \frac{iA_{1,3}}{2} \right. \\
&\quad \left. + \frac{A_{2,0}}{2} - \frac{iA_{2,3}}{2} - \frac{A_{3,0}}{2} + \frac{iA_{3,3}}{2} \right) \\
M_7 &= \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,1} \right. \\
&\quad \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,1} \right) \left(-\frac{B_{0,0}}{2} + \frac{B_{0,3}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,3}}{2} - \frac{B_{2,0}}{2} + \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,3}}{2} \right)
\end{aligned}$$

$$\begin{aligned}
M_8 &= \left(\frac{B_{0,0}}{2} - \frac{B_{0,2}}{2} - \frac{B_{0,3}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,2}}{2} - \frac{B_{1,3}}{2} + \frac{B_{2,1}}{2} - \frac{iB_{3,1}}{2} \right) \left(-\frac{iA_{0,0}}{2} - \frac{iA_{0,1}}{2} - \frac{A_{0,2}}{2} - \frac{iA_{0,3}}{2} + \frac{A_{1,0}}{2} \right. \\
&\quad \left. + \frac{A_{1,1}}{2} - \frac{iA_{1,2}}{2} + \frac{A_{1,3}}{2} - \frac{A_{2,0}}{2} - \frac{A_{2,1}}{2} - \frac{iA_{2,2}}{2} + \frac{A_{2,3}}{2} + \frac{A_{3,0}}{2} + \frac{A_{3,1}}{2} + \frac{iA_{3,2}}{2} - \frac{A_{3,3}}{2} \right) \\
M_9 &= \left(\left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,3} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,0} \right. \\
&\quad \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,3} \right) \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{0,3}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,2}}{2} \right. \\
&\quad \left. + \frac{iB_{1,3}}{2} - \frac{iB_{2,1}}{2} - \frac{iB_{2,2}}{2} - \frac{iB_{2,3}}{2} + \frac{B_{3,1}}{2} + \frac{B_{3,2}}{2} + \frac{B_{3,3}}{2} \right) \\
M_{10} &= \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,3}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{1,3}}{2} - \frac{iB_{2,1}}{2} - \frac{iB_{2,3}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,3}}{2} \right) \left(\left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{0,1} \right. \\
&\quad \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,1} \right) \\
M_{11} &= \left(-\frac{iB_{0,0}}{2} + \frac{iB_{0,3}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{1,3}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,2}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,2}}{2} \right) \left(\frac{A_{0,0}}{2} + \frac{A_{0,1}}{2} - \frac{iA_{0,2}}{2} - \frac{A_{0,3}}{2} \right. \\
&\quad \left. - \frac{A_{1,0}}{2} - \frac{A_{1,1}}{2} + \frac{iA_{1,2}}{2} + \frac{A_{1,3}}{2} + \frac{A_{2,0}}{2} + \frac{A_{2,1}}{2} + \frac{iA_{2,2}}{2} + \frac{A_{2,3}}{2} - \frac{iA_{3,0}}{2} - \frac{iA_{3,1}}{2} + \frac{A_{3,2}}{2} - \frac{iA_{3,3}}{2} \right) \\
M_{12} &= \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,1} \right. \\
&\quad \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,2} \right) \left(-\frac{B_{0,0}}{2} + \frac{B_{0,2}}{2} + \frac{B_{0,3}}{2} - \frac{B_{1,0}}{2} + \frac{B_{1,2}}{2} + \frac{B_{1,3}}{2} \right. \\
&\quad \left. + \frac{B_{2,0}}{2} - \frac{B_{2,2}}{2} - \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,2}}{2} - \frac{iB_{3,3}}{2} \right) \\
M_{13} &= \left(\frac{iB_{0,0}}{2} - \frac{iB_{0,2}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{1,2}}{2} + \frac{iB_{2,0}}{2} - \frac{iB_{2,2}}{2} - \frac{B_{3,0}}{2} + \frac{B_{3,2}}{2} \right) \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,2} \right. \\
&\quad \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,2} \right) \\
M_{14} &= \left(-\frac{B_{0,1}}{2} - \frac{B_{1,0}}{2} + \frac{B_{2,0}}{2} + \frac{iB_{3,1}}{2} \right) \left(\frac{iA_{0,0}}{2} - \frac{A_{0,1}}{2} + \frac{A_{0,2}}{2} - \frac{A_{0,3}}{2} + \frac{A_{1,0}}{2} - \frac{iA_{1,1}}{2} + \frac{iA_{1,2}}{2} + \frac{iA_{1,3}}{2} \right. \\
&\quad \left. + \frac{A_{2,0}}{2} + \frac{iA_{2,1}}{2} - \frac{iA_{2,2}}{2} + \frac{iA_{2,3}}{2} + \frac{A_{3,0}}{2} - \frac{iA_{3,1}}{2} + \frac{iA_{3,2}}{2} + \frac{iA_{3,3}}{2} \right) \\
M_{15} &= \left(\frac{iB_{0,0}}{2} - \frac{iB_{0,3}}{2} + \frac{iB_{1,0}}{2} - \frac{iB_{1,3}}{2} - \frac{iB_{2,0}}{2} + \frac{iB_{2,3}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,3}}{2} \right) \left(\left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,3} \right. \\
&\quad \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,2} \right. \\
&\quad \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right) \\
M_{16} &= \left(\frac{B_{0,1}}{2} + \frac{B_{0,2}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,2}}{2} + \frac{B_{2,0}}{2} - \frac{B_{2,2}}{2} - \frac{iB_{3,1}}{2} - \frac{iB_{3,2}}{2} \right) \left(-\frac{A_{0,0}}{2} + \frac{iA_{0,1}}{2} + \frac{iA_{0,2}}{2} - \frac{iA_{0,3}}{2} - \frac{A_{1,0}}{2} \right. \\
&\quad \left. - \frac{iA_{1,1}}{2} - \frac{iA_{1,2}}{2} - \frac{iA_{1,3}}{2} - \frac{A_{2,0}}{2} + \frac{iA_{2,1}}{2} + \frac{iA_{2,2}}{2} - \frac{iA_{2,3}}{2} - \frac{iA_{3,0}}{2} + \frac{A_{3,1}}{2} + \frac{A_{3,2}}{2} + \frac{A_{3,3}}{2} \right)
\end{aligned}$$

$$M_{17} = \left(-\frac{iB_{0,0}}{2} + \frac{iB_{0,2}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{1,2}}{2} - \frac{iB_{2,0}}{2} + \frac{iB_{2,2}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,2}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,1} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,1} \right)$$

$$M_{18} = \left(-\frac{iB_{0,1}}{2} - \frac{iB_{0,3}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{1,3}}{2} - \frac{iB_{2,0}}{2} + \frac{iB_{2,2}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,2}}{2} \right) \left(\frac{iA_{0,0}}{2} + \frac{iA_{0,1}}{2} - \frac{A_{0,2}}{2} + \frac{iA_{0,3}}{2} \right. \\ \left. + \frac{iA_{1,0}}{2} + \frac{iA_{1,1}}{2} - \frac{A_{1,2}}{2} + \frac{iA_{1,3}}{2} + \frac{iA_{2,0}}{2} + \frac{iA_{2,1}}{2} + \frac{A_{2,2}}{2} - \frac{iA_{2,3}}{2} - \frac{A_{3,0}}{2} - \frac{A_{3,1}}{2} + \frac{iA_{3,2}}{2} + \frac{A_{3,3}}{2} \right)$$

$$M_{19} = \left(-\frac{iB_{0,0}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{1,0}}{2} - \frac{iB_{1,2}}{2} + \frac{iB_{2,0}}{2} - \frac{iB_{2,2}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,2}}{2} \right) \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,3} \right. \\ \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right)$$

$$M_{20} = \left(-\frac{iB_{0,1}}{2} - \frac{iB_{0,3}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{1,3}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,3}}{2} + \frac{B_{3,1}}{2} + \frac{B_{3,3}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,2} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,2} \right)$$

$$M_{21} = \left(-\frac{B_{0,1}}{2} - \frac{B_{0,2}}{2} + \frac{B_{1,1}}{2} + \frac{B_{1,2}}{2} - \frac{B_{2,0}}{2} + \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,3}}{2} \right) \left(\frac{iA_{0,0}}{2} - \frac{iA_{0,1}}{2} - \frac{A_{0,2}}{2} - \frac{iA_{0,3}}{2} - \frac{iA_{1,0}}{2} \right. \\ \left. + \frac{iA_{1,1}}{2} + \frac{A_{1,2}}{2} + \frac{iA_{1,3}}{2} - \frac{iA_{2,0}}{2} + \frac{iA_{2,1}}{2} - \frac{A_{2,2}}{2} - \frac{iA_{2,3}}{2} - \frac{A_{3,0}}{2} + \frac{A_{3,1}}{2} + \frac{iA_{3,2}}{2} - \frac{A_{3,3}}{2} \right)$$

$$M_{22} = \left(\left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,0} \right. \\ \left. + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right) \left(-\frac{iB_{0,0}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{0,3}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{1,2}}{2} \right. \\ \left. + \frac{iB_{1,3}}{2} - \frac{iB_{2,0}}{2} + \frac{iB_{2,2}}{2} + \frac{iB_{2,3}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,2}}{2} - \frac{B_{3,3}}{2} \right)$$

$$M_{23} = \left(\left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{0,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,3} \right) \left(-\frac{B_{0,0}}{2} + \frac{B_{0,2}}{2} + \frac{B_{0,3}}{2} - \frac{B_{1,0}}{2} + \frac{B_{1,2}}{2} \right. \\ \left. + \frac{B_{1,3}}{2} - \frac{B_{2,0}}{2} + \frac{B_{2,2}}{2} + \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,2}}{2} - \frac{iB_{3,3}}{2} \right)$$

$$M_{24} = \left(\frac{iB_{0,1}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{2,0}}{2} + \frac{iB_{2,2}}{2} + \frac{iB_{2,3}}{2} + \frac{B_{3,0}}{2} - \frac{B_{3,2}}{2} - \frac{B_{3,3}}{2} \right) \left(-\frac{A_{0,0}}{2} + \frac{A_{0,1}}{2} - \frac{iA_{0,2}}{2} - \frac{A_{0,3}}{2} - \frac{iA_{1,0}}{2} \right. \\ \left. + \frac{iA_{1,1}}{2} + \frac{A_{1,2}}{2} - \frac{iA_{1,3}}{2} - \frac{iA_{2,0}}{2} + \frac{iA_{2,1}}{2} - \frac{A_{2,2}}{2} + \frac{iA_{2,3}}{2} + \frac{iA_{3,0}}{2} - \frac{iA_{3,1}}{2} + \frac{A_{3,2}}{2} - \frac{iA_{3,3}}{2} \right)$$

$$M_{25} = \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,2} \right. \\ \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,3} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right) \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{0,3}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,2}}{2} \right. \\ \left. + \frac{iB_{1,3}}{2} - \frac{iB_{2,1}}{2} - \frac{iB_{2,2}}{2} - \frac{iB_{2,3}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,2}}{2} - \frac{B_{3,3}}{2} \right)$$

$$M_{26} = \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,2} \right. \\ \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,2} \right) \left(\frac{B_{0,1}}{2} + \frac{B_{0,2}}{2} - \frac{B_{1,1}}{2} - \frac{B_{1,2}}{2} - \frac{B_{2,1}}{2} - \frac{B_{2,2}}{2} - \frac{iB_{3,1}}{2} - \frac{iB_{3,2}}{2} \right)$$

$$M_{27} = \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{0,3}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,2}}{2} + \frac{iB_{1,3}}{2} - \frac{iB_{2,0}}{2} - \frac{B_{3,0}}{2} \right) \left(-\frac{iA_{0,0}}{2} - \frac{iA_{0,1}}{2} + \frac{A_{0,2}}{2} + \frac{iA_{0,3}}{2} \right. \\ \left. - \frac{A_{1,0}}{2} - \frac{A_{1,1}}{2} - \frac{iA_{1,2}}{2} + \frac{A_{1,3}}{2} - \frac{A_{2,0}}{2} - \frac{A_{2,1}}{2} + \frac{iA_{2,2}}{2} - \frac{A_{2,3}}{2} - \frac{A_{3,0}}{2} - \frac{A_{3,1}}{2} + \frac{iA_{3,2}}{2} - \frac{A_{3,3}}{2} \right)$$

$$M_{28} = \left(\frac{B_{0,1}}{2} + \frac{B_{1,1}}{2} + \frac{B_{2,1}}{2} - \frac{iB_{3,1}}{2} \right) \left(\left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,0} \right. \\ \left. + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,1} \right)$$

$$M_{29} = \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,2}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{1,2}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,2}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,2}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{0,3} \right. \\ \left. + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,3} \right)$$

$$M_{30} = \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,2} \right. \\ \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,2} \right) \left(-\frac{B_{0,0}}{2} + \frac{B_{0,3}}{2} - \frac{B_{1,0}}{2} + \frac{B_{1,3}}{2} - \frac{B_{2,0}}{2} + \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,3}}{2} \right)$$

$$M_{31} = \left(\frac{B_{0,0}}{2} - \frac{B_{0,2}}{2} - \frac{B_{1,0}}{2} + \frac{B_{1,2}}{2} - \frac{B_{2,1}}{2} - \frac{B_{2,3}}{2} + \frac{iB_{3,1}}{2} + \frac{iB_{3,3}}{2} \right) \left(\frac{A_{0,0}}{2} - \frac{A_{0,1}}{2} - \frac{iA_{0,2}}{2} + \frac{A_{0,3}}{2} + \frac{A_{1,0}}{2} \right. \\ \left. - \frac{A_{1,1}}{2} - \frac{iA_{1,2}}{2} + \frac{A_{1,3}}{2} - \frac{A_{2,0}}{2} + \frac{A_{2,1}}{2} - \frac{iA_{2,2}}{2} + \frac{A_{2,3}}{2} - \frac{iA_{3,0}}{2} + \frac{iA_{3,1}}{2} + \frac{A_{3,2}}{2} + \frac{iA_{3,3}}{2} \right)$$

$$M_{32} = \left(\frac{iB_{0,1}}{2} - \frac{iB_{1,1}}{2} - \frac{iB_{2,1}}{2} + \frac{B_{3,1}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{0,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,3} \right. \\ \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right)$$

$$M_{33} = \left(-\frac{B_{0,1}}{2} - \frac{B_{0,3}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,3}}{2} - \frac{B_{2,0}}{2} + \frac{B_{2,3}}{2} - \frac{iB_{3,1}}{2} - \frac{iB_{3,3}}{2} \right) \left(\frac{A_{0,0}}{2} + \frac{iA_{0,1}}{2} - \frac{iA_{0,2}}{2} - \frac{iA_{0,3}}{2} - \frac{A_{1,0}}{2} \right. \\ \left. + \frac{iA_{1,1}}{2} - \frac{iA_{1,2}}{2} + \frac{iA_{1,3}}{2} - \frac{A_{2,0}}{2} - \frac{iA_{2,1}}{2} + \frac{iA_{2,2}}{2} + \frac{iA_{2,3}}{2} + \frac{iA_{3,0}}{2} + \frac{A_{3,1}}{2} - \frac{A_{3,2}}{2} + \frac{A_{3,3}}{2} \right)$$

$$M_{34} = \left(\frac{iB_{0,0}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,2}}{2} + \frac{iB_{2,3}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,2}}{2} - \frac{B_{3,3}}{2} \right) \left(-\frac{iA_{0,0}}{2} + \frac{iA_{0,1}}{2} - \frac{A_{0,2}}{2} + \frac{iA_{0,3}}{2} \right. \\ \left. - \frac{A_{1,0}}{2} + \frac{A_{1,1}}{2} + \frac{iA_{1,2}}{2} + \frac{A_{1,3}}{2} + \frac{A_{2,0}}{2} - \frac{A_{2,1}}{2} + \frac{iA_{2,2}}{2} + \frac{A_{2,3}}{2} + \frac{A_{3,0}}{2} - \frac{A_{3,1}}{2} + \frac{iA_{3,2}}{2} + \frac{A_{3,3}}{2} \right)$$

$$M_{35} = \left(-\frac{iB_{0,1}}{2} - \frac{iB_{0,2}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,2}}{2} - \frac{iB_{2,1}}{2} - \frac{iB_{2,2}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,2}}{2} \right) \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,3} \right. \\ \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,3} \right)$$

$$M_{36} = \left(\left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,1} \right. \\ \left. + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,2} \right) \left(-\frac{B_{0,1}}{2} - \frac{B_{0,2}}{2} - \frac{B_{0,3}}{2} - \frac{B_{1,1}}{2} - \frac{B_{1,2}}{2} - \frac{B_{1,3}}{2} \right. \\ \left. - \frac{B_{2,1}}{2} - \frac{B_{2,2}}{2} - \frac{B_{2,3}}{2} - \frac{iB_{3,1}}{2} - \frac{iB_{3,2}}{2} - \frac{iB_{3,3}}{2} \right)$$

$$M_{37} = \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{0,3}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{1,2}}{2} + \frac{iB_{1,3}}{2} - \frac{iB_{2,0}}{2} + \frac{iB_{2,2}}{2} + \frac{iB_{2,3}}{2} - \frac{B_{3,1}}{2} - \frac{B_{3,2}}{2} \right. \\ \left. - \frac{B_{3,3}}{2} \right) \left(\frac{A_{0,0}}{2} - \frac{iA_{0,1}}{2} - \frac{iA_{0,2}}{2} - \frac{iA_{0,3}}{2} + \frac{iA_{1,0}}{2} - \frac{A_{1,1}}{2} - \frac{A_{1,2}}{2} + \frac{A_{1,3}}{2} + \frac{iA_{2,0}}{2} + \frac{A_{2,1}}{2} + \frac{A_{2,2}}{2} \right. \\ \left. + \frac{A_{2,3}}{2} - \frac{iA_{3,0}}{2} + \frac{A_{3,1}}{2} + \frac{A_{3,2}}{2} - \frac{A_{3,3}}{2} \right)$$

$$M_{38} = \left(\frac{iB_{0,0}}{2} - \frac{iB_{1,0}}{2} - \frac{iB_{2,0}}{2} - \frac{B_{3,0}}{2} \right) \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,2} \right. \\ \left. + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,2} \right)$$

$$M_{39} = \left(-\frac{iB_{0,0}}{2} + \frac{iB_{0,3}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,3}}{2} + \frac{iB_{2,1}}{2} + \frac{iB_{2,3}}{2} - \frac{B_{3,0}}{2} + \frac{B_{3,3}}{2} \right) \left(-\frac{A_{0,0}}{2} - \frac{iA_{0,1}}{2} - \frac{iA_{0,2}}{2} - \frac{iA_{0,3}}{2} \right. \\ \left. - \frac{A_{1,0}}{2} + \frac{iA_{1,1}}{2} + \frac{iA_{1,2}}{2} - \frac{iA_{1,3}}{2} + \frac{A_{2,0}}{2} + \frac{iA_{2,1}}{2} + \frac{iA_{2,2}}{2} + \frac{iA_{2,3}}{2} + \frac{iA_{3,0}}{2} + \frac{A_{3,1}}{2} + \frac{A_{3,2}}{2} - \frac{A_{3,3}}{2} \right)$$

$$M_{40} = \left(\frac{iB_{0,1}}{2} + \frac{iB_{0,2}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,2}}{2} - \frac{iB_{2,1}}{2} - \frac{iB_{2,2}}{2} + \frac{B_{3,1}}{2} + \frac{B_{3,2}}{2} \right) \left(\left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,0} \right. \\ \left. + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,1} \right. \\ \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,1} \right)$$

$$M_{41} = \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,3} \right) \left(\frac{B_{0,0}}{2} - \frac{B_{0,3}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,3}}{2} - \frac{B_{2,0}}{2} + \frac{B_{2,3}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,3}}{2} \right)$$

$$M_{42} = \left(\frac{iB_{0,0}}{2} - \frac{iB_{1,0}}{2} + \frac{iB_{2,0}}{2} + \frac{B_{3,0}}{2} \right) \left(\left(\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,0} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right)$$

$$M_{43} = \left(\frac{B_{0,0}}{2} - \frac{B_{0,2}}{2} - \frac{B_{0,3}}{2} - \frac{B_{1,1}}{2} - \frac{B_{1,2}}{2} - \frac{B_{1,3}}{2} + \frac{B_{2,1}}{2} + \frac{B_{2,2}}{2} + \frac{B_{2,3}}{2} - \frac{iB_{3,0}}{2} + \frac{iB_{3,2}}{2} + \frac{iB_{3,3}}{2} \right) \left(\frac{iA_{0,0}}{2} \right. \\ \left. + \frac{A_{0,1}}{2} - \frac{A_{0,2}}{2} - \frac{A_{0,3}}{2} + \frac{A_{1,0}}{2} + \frac{iA_{1,1}}{2} - \frac{iA_{1,2}}{2} + \frac{iA_{1,3}}{2} - \frac{A_{2,0}}{2} + \frac{iA_{2,1}}{2} - \frac{iA_{2,2}}{2} - \frac{iA_{2,3}}{2} - \frac{A_{3,0}}{2} \right. \\ \left. - \frac{iA_{3,1}}{2} + \frac{iA_{3,2}}{2} - \frac{iA_{3,3}}{2} \right)$$

$$M_{44} = \left(-\frac{iB_{0,0}}{2} + \frac{iB_{1,0}}{2} - \frac{iB_{2,0}}{2} + \frac{B_{3,0}}{2} \right) \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,2} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{0,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,2} \right. \\ \left. + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{2,3} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,2} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right)$$

$$M_{45} = \left(\left(-\frac{1}{2} + \frac{i}{2} \right) A_{0,0} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{0,1} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,0} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{1,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{2,0} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,1} + \left(-\frac{1}{2} - \frac{i}{2} \right) A_{3,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,1} \right) \left(-\frac{iB_{0,1}}{2} - \frac{iB_{0,2}}{2} - \frac{iB_{0,3}}{2} + \frac{iB_{1,1}}{2} + \frac{iB_{1,2}}{2} \right. \\ \left. + \frac{iB_{1,3}}{2} - \frac{iB_{2,1}}{2} - \frac{iB_{2,2}}{2} - \frac{iB_{2,3}}{2} + \frac{B_{3,1}}{2} + \frac{B_{3,2}}{2} + \frac{B_{3,3}}{2} \right)$$

$$M_{46} = \left(\left(\frac{1}{2} - \frac{i}{2} \right) A_{0,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{0,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{1,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{1,3} + \left(\frac{1}{2} - \frac{i}{2} \right) A_{2,0} + \left(\frac{1}{2} + \frac{i}{2} \right) A_{2,3} \right. \\ \left. + \left(\frac{1}{2} + \frac{i}{2} \right) A_{3,0} + \left(-\frac{1}{2} + \frac{i}{2} \right) A_{3,3} \right) \left(-\frac{B_{0,0}}{2} + \frac{B_{0,2}}{2} + \frac{B_{1,0}}{2} - \frac{B_{1,2}}{2} + \frac{B_{2,0}}{2} - \frac{B_{2,2}}{2} + \frac{iB_{3,0}}{2} - \frac{iB_{3,2}}{2} \right)$$

$$M_{47} = \left(\frac{B_{0,0}}{2} + \frac{B_{1,1}}{2} + \frac{B_{2,1}}{2} + \frac{iB_{3,0}}{2} \right) \left(\frac{A_{0,0}}{2} + \frac{iA_{0,1}}{2} + \frac{iA_{0,2}}{2} - \frac{iA_{0,3}}{2} + \frac{iA_{1,0}}{2} + \frac{A_{1,1}}{2} + \frac{A_{1,2}}{2} + \frac{A_{1,3}}{2} \right. \\ \left. - \frac{iA_{2,0}}{2} + \frac{A_{2,1}}{2} + \frac{A_{2,2}}{2} - \frac{A_{2,3}}{2} + \frac{iA_{3,0}}{2} + \frac{A_{3,1}}{2} + \frac{A_{3,2}}{2} + \frac{A_{3,3}}{2} \right)$$

$$C_{0,0} = \frac{iM_0}{2} - \frac{iM_1}{2} - \frac{M_{11}}{2} + \frac{iM_{11}}{2} + \frac{M_{14}}{2} - \frac{iM_{15}}{2} - \frac{M_{16}}{2} - \frac{iM_{16}}{2} + \frac{iM_{17}}{2} - \frac{M_{18}}{2} - \frac{iM_{18}}{2} \\ - \frac{iM_{24}}{2} + \frac{iM_{26}}{2} + \frac{iM_{27}}{2} + \frac{M_{28}}{2} + \frac{iM_{30}}{2} - \frac{iM_{32}}{2} + \frac{M_{34}}{2} + \frac{M_{36}}{2} - \frac{iM_{37}}{2} - \frac{M_{38}}{2} \\ + \frac{M_{39}}{2} - \frac{iM_{39}}{2} - \frac{iM_{40}}{2} - \frac{M_{42}}{2} - \frac{M_{43}}{2} - \frac{M_{44}}{2} - \frac{iM_{46}}{2} + \frac{M_{47}}{2} - \frac{M_5}{2} + \frac{M_8}{2} + \frac{iM_9}{2}$$

$$C_{0,1} = -\frac{iM_0}{2} + \frac{M_{11}}{2} - \frac{iM_{11}}{2} - \frac{M_{12}}{2} + \frac{iM_{13}}{2} + \frac{iM_{14}}{2} + \frac{iM_{15}}{2} - \frac{iM_{17}}{2} + \frac{M_{18}}{2} + \frac{iM_{18}}{2} \\ + \frac{M_2}{2} + \frac{M_{20}}{2} - \frac{M_{22}}{2} + \frac{iM_{24}}{2} - \frac{iM_{27}}{2} - \frac{M_{28}}{2} - \frac{iM_{29}}{2} - \frac{M_3}{2} - \frac{iM_3}{2} + \frac{iM_{32}}{2} - \frac{M_{33}}{2} \\ - \frac{iM_{33}}{2} - \frac{M_{34}}{2} - \frac{M_{37}}{2} + \frac{iM_{40}}{2} + \frac{iM_{41}}{2} - \frac{iM_{43}}{2} + \frac{M_{44}}{2} - \frac{iM_{47}}{2} + \frac{M_5}{2} + \frac{M_6}{2} - \frac{M_8}{2}$$

$$C_{0,2} = \frac{iM_{11}}{2} + \frac{M_{12}}{2} - \frac{iM_{13}}{2} - \frac{iM_{14}}{2} - \frac{iM_{15}}{2} - \frac{M_{16}}{2} - \frac{M_{18}}{2} + \frac{iM_{19}}{2} - \frac{M_2}{2} - \frac{M_{20}}{2} + \frac{iM_{21}}{2} \\ - \frac{M_{23}}{2} - \frac{iM_{24}}{2} - \frac{M_{25}}{2} + \frac{iM_{26}}{2} + \frac{M_{27}}{2} + \frac{M_3}{2} + \frac{iM_{30}}{2} - \frac{M_{31}}{2} - \frac{iM_{32}}{2} + \frac{M_{33}}{2} \\ + \frac{M_{34}}{2} + \frac{iM_{35}}{2} + \frac{M_{36}}{2} - \frac{iM_{37}}{2} - \frac{M_{38}}{2} - \frac{iM_{39}}{2} + \frac{iM_{43}}{2} - \frac{M_{44}}{2} + \frac{M_{47}}{2} - \frac{M_5}{2} - \frac{iM_8}{2}$$

$$C_{0,3} = \frac{iM_0}{2} - \frac{iM_1}{2} - \frac{M_{10}}{2} - \frac{M_{11}}{2} + \frac{M_{14}}{2} - \frac{iM_{16}}{2} + \frac{iM_{17}}{2} - \frac{iM_{18}}{2} - \frac{M_{21}}{2} + \frac{M_{22}}{2} + \frac{M_{24}}{2} \\ + \frac{iM_{27}}{2} + \frac{M_{28}}{2} + \frac{iM_{29}}{2} + \frac{iM_3}{2} - \frac{iM_{31}}{2} + \frac{iM_{33}}{2} + \frac{iM_{34}}{2} + \frac{M_{37}}{2} + \frac{M_{39}}{2} - \frac{iM_4}{2} \\ - \frac{iM_{40}}{2} - \frac{iM_{41}}{2} - \frac{M_{42}}{2} - \frac{M_{43}}{2} - \frac{iM_{45}}{2} - \frac{iM_{46}}{2} + \frac{iM_{47}}{2} - \frac{M_6}{2} + \frac{M_7}{2} + \frac{M_8}{2} + \frac{iM_9}{2}$$

$$C_{1,0} = -\frac{M_0}{2} - \frac{M_1}{2} + \frac{M_{11}}{2} - \frac{iM_{11}}{2} - \frac{iM_{14}}{2} + \frac{iM_{15}}{2} - \frac{M_{16}}{2} + \frac{iM_{16}}{2} + \frac{iM_{17}}{2} - \frac{M_{18}}{2} - \frac{iM_{18}}{2} \\ - \frac{M_{24}}{2} + \frac{M_{26}}{2} - \frac{M_{27}}{2} - \frac{iM_{28}}{2} + \frac{M_{30}}{2} - \frac{M_{32}}{2} + \frac{iM_{34}}{2} + \frac{M_{36}}{2} - \frac{M_{37}}{2} - \frac{M_{38}}{2} - \frac{M_{39}}{2} \\ - \frac{iM_{39}}{2} + \frac{iM_{40}}{2} + \frac{M_{42}}{2} + \frac{iM_{43}}{2} - \frac{iM_{44}}{2} - \frac{M_{46}}{2} - \frac{iM_{47}}{2} - \frac{M_5}{2} - \frac{iM_8}{2} - \frac{iM_9}{2}$$

$$C_{1,1} = \frac{M_0}{2} - \frac{M_{11}}{2} + \frac{iM_{11}}{2} + \frac{M_{12}}{2} - \frac{M_{13}}{2} - \frac{M_{14}}{2} - \frac{iM_{15}}{2} - \frac{iM_{17}}{2} + \frac{M_{18}}{2} + \frac{iM_{18}}{2} - \frac{M_2}{2} \\ + \frac{iM_{20}}{2} - \frac{M_{22}}{2} + \frac{M_{24}}{2} + \frac{M_{27}}{2} + \frac{iM_{28}}{2} + \frac{M_{29}}{2} + \frac{M_3}{2} - \frac{iM_3}{2} + \frac{M_{32}}{2} + \frac{M_{33}}{2} - \frac{iM_{33}}{2} \\ - \frac{iM_{34}}{2} - \frac{iM_{37}}{2} - \frac{iM_{40}}{2} - \frac{M_{41}}{2} + \frac{M_{43}}{2} + \frac{iM_{44}}{2} + \frac{M_{47}}{2} + \frac{M_5}{2} + \frac{M_6}{2} + \frac{iM_8}{2}$$

$$C_{1,2} = -\frac{iM_{11}}{2} - \frac{M_{12}}{2} + \frac{M_{13}}{2} + \frac{M_{14}}{2} + \frac{iM_{15}}{2} - \frac{M_{16}}{2} - \frac{M_{18}}{2} + \frac{iM_{19}}{2} + \frac{M_2}{2} - \frac{iM_{20}}{2} \\ - \frac{iM_{21}}{2} + \frac{iM_{23}}{2} - \frac{M_{24}}{2} - \frac{iM_{25}}{2} + \frac{M_{26}}{2} + \frac{iM_{27}}{2} - \frac{M_3}{2} + \frac{M_{30}}{2} - \frac{M_{31}}{2} - \frac{M_{32}}{2} - \frac{M_{33}}{2} \\ + \frac{iM_{34}}{2} - \frac{iM_{35}}{2} + \frac{M_{36}}{2} - \frac{M_{37}}{2} - \frac{M_{38}}{2} - \frac{iM_{39}}{2} - \frac{M_{43}}{2} - \frac{iM_{44}}{2} - \frac{iM_{47}}{2} - \frac{M_5}{2} - \frac{M_8}{2}$$

$$C_{1,3} = -\frac{M_0}{2} - \frac{M_1}{2} - \frac{M_{10}}{2} + \frac{M_{11}}{2} - \frac{iM_{14}}{2} + \frac{iM_{16}}{2} + \frac{iM_{17}}{2} - \frac{iM_{18}}{2} + \frac{M_{21}}{2} + \frac{M_{22}}{2} - \frac{iM_{24}}{2} \\ - \frac{M_{27}}{2} - \frac{iM_{28}}{2} - \frac{M_{29}}{2} + \frac{iM_3}{2} - \frac{iM_{31}}{2} + \frac{iM_{33}}{2} - \frac{M_{34}}{2} + \frac{iM_{37}}{2} - \frac{M_{39}}{2} - \frac{M_4}{2} \\ + \frac{iM_{40}}{2} + \frac{M_{41}}{2} + \frac{M_{42}}{2} + \frac{iM_{43}}{2} + \frac{M_{45}}{2} - \frac{M_{46}}{2} - \frac{M_{47}}{2} - \frac{M_6}{2} - \frac{M_7}{2} - \frac{iM_8}{2} - \frac{iM_9}{2}$$

$$C_{2,0} = -\frac{iM_0}{2} + \frac{iM_1}{2} + \frac{M_{11}}{2} + \frac{iM_{11}}{2} + \frac{iM_{14}}{2} - \frac{M_{15}}{2} - \frac{M_{16}}{2} - \frac{iM_{16}}{2} + \frac{M_{17}}{2} - \frac{M_{18}}{2} + \frac{iM_{18}}{2} \\ - \frac{M_{24}}{2} + \frac{iM_{26}}{2} + \frac{M_{27}}{2} - \frac{M_{28}}{2} - \frac{iM_{30}}{2} - \frac{iM_{32}}{2} - \frac{iM_{34}}{2} - \frac{iM_{36}}{2} - \frac{M_{37}}{2} - \frac{iM_{38}}{2} \\ - \frac{M_{39}}{2} + \frac{iM_{39}}{2} - \frac{M_{40}}{2} - \frac{iM_{42}}{2} + \frac{iM_{43}}{2} - \frac{M_{44}}{2} - \frac{iM_{46}}{2} + \frac{iM_{47}}{2} + \frac{iM_5}{2} - \frac{iM_8}{2} + \frac{M_9}{2}$$

$$C_{2,1} = \frac{iM_0}{2} - \frac{M_{11}}{2} - \frac{iM_{11}}{2} + \frac{iM_{12}}{2} + \frac{iM_{13}}{2} - \frac{M_{14}}{2} + \frac{M_{15}}{2} - \frac{M_{17}}{2} + \frac{M_{18}}{2} - \frac{iM_{18}}{2} + \frac{iM_2}{2} \\ - \frac{M_{20}}{2} + \frac{iM_{22}}{2} + \frac{M_{24}}{2} - \frac{M_{27}}{2} + \frac{M_{28}}{2} - \frac{iM_{29}}{2} - \frac{M_3}{2} - \frac{iM_3}{2} + \frac{iM_{32}}{2} + \frac{M_{33}}{2} + \frac{iM_{33}}{2} \\ + \frac{iM_{34}}{2} + \frac{iM_{37}}{2} + \frac{M_{40}}{2} - \frac{iM_{41}}{2} - \frac{M_{43}}{2} + \frac{M_{44}}{2} + \frac{M_{47}}{2} - \frac{iM_5}{2} + \frac{iM_6}{2} + \frac{iM_8}{2}$$

$$C_{2,2} = \frac{iM_{11}}{2} - \frac{iM_{12}}{2} - \frac{iM_{13}}{2} + \frac{M_{14}}{2} - \frac{M_{15}}{2} - \frac{M_{16}}{2} - \frac{M_{18}}{2} - \frac{M_{19}}{2} - \frac{iM_2}{2} + \frac{M_{20}}{2} - \frac{iM_{21}}{2} \\ + \frac{M_{23}}{2} - \frac{M_{24}}{2} + \frac{M_{25}}{2} + \frac{iM_{26}}{2} + \frac{iM_{27}}{2} + \frac{M_3}{2} - \frac{iM_{30}}{2} + \frac{M_{31}}{2} - \frac{iM_{32}}{2} - \frac{M_{33}}{2} \\ - \frac{iM_{34}}{2} - \frac{M_{35}}{2} - \frac{iM_{36}}{2} - \frac{M_{37}}{2} - \frac{iM_{38}}{2} + \frac{iM_{39}}{2} + \frac{M_{43}}{2} - \frac{M_{44}}{2} + \frac{iM_{47}}{2} + \frac{iM_5}{2} + \frac{M_8}{2}$$

$$C_{2,3} = -\frac{iM_0}{2} + \frac{iM_1}{2} - \frac{iM_{10}}{2} + \frac{M_{11}}{2} + \frac{iM_{14}}{2} - \frac{iM_{16}}{2} + \frac{M_{17}}{2} + \frac{iM_{18}}{2} - \frac{M_{21}}{2} - \frac{iM_{22}}{2} \\ + \frac{iM_{24}}{2} + \frac{M_{27}}{2} - \frac{M_{28}}{2} + \frac{iM_{29}}{2} + \frac{iM_3}{2} - \frac{iM_{31}}{2} - \frac{iM_{33}}{2} - \frac{M_{34}}{2} - \frac{iM_{37}}{2} - \frac{M_{39}}{2} - \frac{iM_4}{2} \\ - \frac{M_{40}}{2} + \frac{iM_{41}}{2} - \frac{iM_{42}}{2} + \frac{iM_{43}}{2} - \frac{iM_{45}}{2} - \frac{iM_{46}}{2} - \frac{M_{47}}{2} - \frac{iM_6}{2} + \frac{iM_7}{2} - \frac{iM_8}{2} + \frac{M_9}{2}$$

$$C_{3,0} = -\frac{iM_0}{2} - \frac{iM_1}{2} - \frac{M_{11}}{2} + \frac{iM_{11}}{2} - \frac{iM_{14}}{2} - \frac{iM_{15}}{2} + \frac{M_{16}}{2} + \frac{iM_{16}}{2} - \frac{iM_{17}}{2} + \frac{M_{18}}{2} \\ + \frac{iM_{18}}{2} + \frac{M_{24}}{2} - \frac{iM_{26}}{2} + \frac{M_{27}}{2} + \frac{M_{28}}{2} + \frac{iM_{30}}{2} + \frac{iM_{32}}{2} - \frac{iM_{34}}{2} - \frac{M_{36}}{2} + \frac{M_{37}}{2} - \frac{M_{38}}{2} \\ + \frac{M_{39}}{2} - \frac{iM_{39}}{2} - \frac{iM_{40}}{2} + \frac{M_{42}}{2} - \frac{iM_{43}}{2} - \frac{M_{44}}{2} + \frac{iM_{46}}{2} - \frac{iM_{47}}{2} + \frac{M_5}{2} + \frac{iM_8}{2} + \frac{iM_9}{2}$$

$$C_{3,1} = \frac{iM_0}{2} + \frac{M_{11}}{2} - \frac{iM_{11}}{2} - \frac{M_{12}}{2} + \frac{iM_{13}}{2} - \frac{M_{14}}{2} + \frac{iM_{15}}{2} + \frac{iM_{17}}{2} - \frac{M_{18}}{2} - \frac{iM_{18}}{2} \\ - \frac{M_2}{2} - \frac{M_{20}}{2} + \frac{M_{22}}{2} - \frac{M_{24}}{2} - \frac{M_{27}}{2} - \frac{M_{28}}{2} - \frac{iM_{29}}{2} - \frac{M_3}{2} - \frac{iM_3}{2} - \frac{iM_{32}}{2} + \frac{M_{33}}{2} \\ + \frac{iM_{33}}{2} + \frac{iM_{34}}{2} + \frac{iM_{37}}{2} + \frac{iM_{40}}{2} - \frac{iM_{41}}{2} - \frac{M_{43}}{2} + \frac{M_{44}}{2} + \frac{M_{47}}{2} - \frac{M_5}{2} + \frac{M_6}{2} - \frac{iM_8}{2}$$

$$\begin{aligned}
C_{3,2} = & -\frac{M_{11}}{2} + \frac{M_{12}}{2} - \frac{iM_{13}}{2} + \frac{M_{14}}{2} - \frac{iM_{15}}{2} + \frac{iM_{16}}{2} + \frac{iM_{18}}{2} + \frac{iM_{19}}{2} + \frac{M_2}{2} + \frac{M_{20}}{2} + \frac{M_{21}}{2} \\
& - \frac{M_{23}}{2} + \frac{M_{24}}{2} + \frac{M_{25}}{2} - \frac{iM_{26}}{2} + \frac{iM_{27}}{2} + \frac{iM_3}{2} + \frac{iM_{30}}{2} - \frac{iM_{31}}{2} + \frac{iM_{32}}{2} - \frac{iM_{33}}{2} \\
& - \frac{iM_{34}}{2} - \frac{iM_{35}}{2} - \frac{M_{36}}{2} + \frac{M_{37}}{2} - \frac{M_{38}}{2} + \frac{M_{39}}{2} + \frac{M_{43}}{2} - \frac{M_{44}}{2} - \frac{iM_{47}}{2} + \frac{M_5}{2} - \frac{M_8}{2}
\end{aligned}$$

$$\begin{aligned}
C_{3,3} = & -\frac{iM_0}{2} - \frac{iM_1}{2} - \frac{M_{10}}{2} + \frac{iM_{11}}{2} - \frac{iM_{14}}{2} + \frac{M_{16}}{2} - \frac{iM_{17}}{2} + \frac{M_{18}}{2} - \frac{iM_{21}}{2} - \frac{M_{22}}{2} \\
& - \frac{iM_{24}}{2} + \frac{M_{27}}{2} + \frac{M_{28}}{2} + \frac{iM_{29}}{2} + \frac{M_3}{2} - \frac{M_{31}}{2} - \frac{M_{33}}{2} - \frac{M_{34}}{2} - \frac{iM_{37}}{2} - \frac{iM_{39}}{2} + \frac{iM_4}{2} \\
& - \frac{iM_{40}}{2} + \frac{iM_{41}}{2} + \frac{M_{42}}{2} - \frac{iM_{43}}{2} - \frac{iM_{45}}{2} + \frac{iM_{46}}{2} - \frac{M_{47}}{2} - \frac{M_6}{2} - \frac{M_7}{2} + \frac{iM_8}{2} + \frac{iM_9}{2}
\end{aligned}$$