Appendix A

Amplification-fitted and minimal phase lag: Method $M^{(2)}$

By substituting Amplification factor equal to zero, one gets following set of equations:

$$
\begin{aligned}
c_{16} =& - c_{12}\sin(\delta)\csc(5\delta) - c_{13}\sin(2\delta)\csc(5\delta) - c_{14}\sin(3\delta)\csc(5\delta) - c_{15}\sin(4\delta)\csc(5\delta) \\
&- \frac{(\sin(4\delta) - 2\sin(5\delta) + \sin(6\delta))\csc(5\delta)}{\delta^2},\\
c_{26} =& - c_{22}\sin(3\delta)\csc(5\delta) - c_{23}\sin(4\delta)\csc(5\delta) - c_{24}\sin(\delta)\csc(5\delta) - c_{25}\sin(2\delta)\csc(5\delta) \\
&- \frac{(2\sin(4\delta) - 3\sin(5\delta) + \sin(7\delta))\csc(5\delta)}{\delta^2},\\
c_{36} =& - c_{32}\sin(\delta)\csc(5\delta) - c_{33}\sin(2\delta)\csc(5\delta) - c_{34}\sin(3\delta)\csc(5\delta) - c_{35}\sin(4\delta)\csc(5\delta) \\
&- \frac{(3\sin(4\delta) - 4\sin(5\delta) + \sin(8\delta))\csc(5\delta)}{\delta^2},\\
c_{46} =& - c_{42}\sin(\delta)\csc(5\delta) - c_{43}\sin(2\delta)\csc(5\delta) - c_{44}\sin(3\delta)\csc(5\delta) - c_{45}\sin(4\delta)\csc(5\delta) \\
&- \frac{(4\sin(4\delta) - 5\sin(5\delta) + \sin(9\delta))\csc(5\delta)}{\delta^2},\\
c_{56} =& - c_{52}\sin(\delta)\csc(5\delta) - c_{53}\sin(2\delta)\csc(5\delta) - c_{54}\sin(3\delta)\csc(5\delta) - c_{55}\sin(4\delta)\csc(5\delta) \\
&- \frac{(5\sin(4\delta) - 6\sin(5\delta) + \sin(10\delta))\csc(5\delta)}{\delta^2},\\
c_{66} =& - c_{62}\sin(\delta)\csc(5\delta) - c_{63}\sin(2\delta)\csc(5\delta) - c_{64}\sin(3\delta)\csc(5\delta) - c_{65}\sin(4\delta)\csc(5\delta) \\
&- \frac{(6\sin(4\delta) - 7\sin(5\delta) + \sin(11\delta))\csc(5\delta)}{\delta^2}.
\end{aligned}
$$

The remaining elements of coefficient matrix are given as

$$
\begin{aligned}
c_{16} =& \frac{1}{240}(-109)\csc(5\delta)\sin(\delta) + \frac{23}{20}\csc(5\delta)\sin(2\delta) - \frac{187}{120}\csc(5\delta)\sin(3\delta) \\
&+ \frac{133}{120}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(\sin(4\delta) - 2\sin(5\delta) + \sin(6\delta))}{\delta^2},
\end{aligned}
$$

$$
\begin{aligned}
c_{26} =& \frac{1}{120}(-1051)\csc(5\delta)\sin(\delta) + \frac{2599}{120}\csc(5\delta)\sin(2\delta) - \frac{1703}{60}\csc(5\delta)\sin(3\delta) \\
&+ \frac{4913}{240}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(2\sin(4\delta) - 3\sin(5\delta) + \sin(7\delta))}{\delta^2}
\end{aligned}
$$

$$
\begin{aligned}
c_{36} =& \frac{1}{120}(-6797)\csc(5\delta)\sin(\delta) + \frac{4097}{30}\csc(5\delta)\sin(2\delta) - \frac{10331}{60}\csc(5\delta)\sin(3\delta) \\
&+ \frac{7009}{60}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(3\sin(4\delta) - 4\sin(5\delta) + \sin(8\delta))}{\delta^2},
\end{aligned}
$$

$$
\begin{aligned}
c_{46} =& \frac{1}{12}(-2803)\csc(5\delta)\sin(\delta) + \frac{6619}{12}\csc(5\delta)\sin(2\delta) - \frac{1349}{2}\csc(5\delta)\sin(3\delta) \\
&+ \frac{3487}{8}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(4\sin(4\delta) - 5\sin(5\delta) + \sin(9\delta))}{\delta^2},
\end{aligned}
$$

$$
\begin{aligned}
c_{56} =& \frac{1}{48}(-35579)\csc(5\delta)\sin(\delta) + \frac{20651}{12}\csc(5\delta)\sin(2\delta) - \frac{49309}{24}\csc(5\delta)\sin(3\delta) \\
&+ \frac{30715}{24}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(5\sin(4\delta) - 6\sin(5\delta) + \sin(10\delta))}{\delta^2}
\end{aligned}
$$

$$
\begin{aligned}
c_{66} =& \frac{1}{120}(-236857)\csc(5\delta)\sin(\delta) + \frac{542293}{120}\csc(5\delta)\sin(2\delta) - \frac{317581}{60}\csc(5\delta)\sin(3\delta) \\
&+ \frac{769331}{240}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(6\sin(4\delta) - 7\sin(5\delta) + \sin(11\delta))}{\delta^2}
\end{aligned}
$$

Amplification-fitted and phase-fitted: Method $M^{(3)}$

After eliminating amplification error and phase error, following set of equations is obtained

$$\begin{aligned}
c_{11} =& -c_{12}(\cos\delta - \sin\delta\ \cot(5\delta)) - c_{13}(\cos 2\delta - \sin 2\delta\ \cot(5\delta))\\
&- c_{14}(\cos 3\delta - \sin 3\delta\ \cot(5\delta)) - c_{15}(\cos 4\delta - \sin 4\delta\ \cot(5\delta))\\
&- \frac{\cos 4\delta + \cos 6\delta - \sin 4\delta\ \cot(5\delta) - \sin 6\delta\ \cot(5\delta)}{\delta^2},\\
c_{21} =& -c_{24}(\cos 3\delta - \sin 3\delta\ \cot(5\delta)) - c_{25}(\cos 4\delta - \sin 4\delta\ \cot(5\delta))\\
&- c_{22}(\cos\delta - \sin\delta\ \cot(5\delta)) - c_{23}(\cos 2\delta - \sin 2\delta\ \cot(5\delta))\\
&- \frac{2\cos 4\delta + \cos 7\delta - 2\sin 4\delta\ \cot(5\delta) - \sin 7\delta\ \cot(5\delta)}{\delta^2},\\
c_{31} =& -c_{32}(\cos\delta - \sin\delta\ \cot(5\delta)) - c_{33}(\cos 2\delta - \sin 2\delta\ \cot(5\delta))\\
&- c_{34}(\cos 3\delta - \sin 3\delta\ \cot(5\delta)) - c_{35}(\cos 4\delta - \sin 4\delta\ \cot(5\delta))\\
&- \frac{3\cos 4\delta + \cos 8\delta - 3\sin 4\delta\ \cot(5\delta) - \sin 8\delta\ \cot(5\delta)}{\delta^2},\\
c_{41} =& -c_{42}(\cos\delta - \sin\delta\ \cot(5\delta)) - c_{43}(\cos 2\delta - \sin 2\delta\ \cot(5\delta))\\
&- c_{44}(\cos 3\delta - \sin 3\delta\ \cot(5\delta)) - c_{45}(\cos 4\delta - \sin 4\delta\ \cot(5\delta))\\
&- \frac{4\cos 4\delta + \cos 9\delta - 4\sin 4\delta\ \cot(5\delta) - \sin 9\delta\ \cot(5\delta)}{\delta^2},\\
c_{51} =& -c_{52}(\cos\delta - \sin\delta\ \cot(5\delta)) - c_{53}(\cos 2\delta - \sin 2\delta\ \cot(5\delta))\\
&- c_{54}(\cos 3\delta - \sin 3\delta\ \cot(5\delta)) - c_{55}(\cos 4\delta - \sin 4\delta\ \cot(5\delta))\\
&- \frac{5\cos 4\delta + \cos 10\delta - 5\sin 4\delta\ \cot(5\delta) - \sin 10\delta\ \cot(5\delta)}{\delta^2},\\
c_{61} =& -c_{62}(\cos\delta - \sin\delta\ \cot(5\delta)) - c_{63}(\cos 2\delta - \sin 2\delta\ \cot(5\delta))\\
&- c_{64}(\cos 3\delta - \sin 3\delta\ \cot(5\delta)) - c_{65}(\cos 4\delta - \sin 4\delta\ \cot(5\delta))\\
&- \frac{6\cos 4\delta + \cos 11\delta - 6\sin 4\delta\ \cot(5\delta) - \sin 11\delta\ \cot(5\delta)}{\delta^2}.
\end{aligned}$$

The following are the remaining elements of $C_2^{(3)}$

$$\begin{aligned}
c_{11} =& \frac{1}{240}(-109)(\cos(\delta) - \cot(5\delta)\sin(\delta)) + \frac{23}{20}(\cos(2\delta) - \cot(5\delta)\sin(2\delta)),\\
&- \frac{187}{120}(\cos(3\delta) - \cot(5\delta)\sin(3\delta)) + \frac{133}{120}(\cos(4\delta) - \cot(5\delta)\sin(4\delta))\\
&- \frac{\cos(4\delta) + \cos(6\delta) - \cot(5\delta)\sin(4\delta) - \cot(5\delta)\sin(6\delta)}{\delta^2}
\end{aligned}$$

$$
\begin{aligned}
c_{16} =& \frac{1}{240}(-109)\csc(5\delta)\sin(\delta) + \frac{23}{20}\csc(5\delta)\sin(2\delta) - \frac{187}{120}\csc(5\delta)\sin(3\delta) \\
&+ \frac{133}{120}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(\sin(4\delta) - 2\sin(5\delta) + \sin(6\delta))}{\delta^2}
\end{aligned}
$$

$$
\begin{aligned}
c_{21} =& \frac{1}{120}(-1051)(\cos(\delta) - \cot(5\delta)\sin(\delta)) + \frac{2599}{120}(\cos(2\delta) - \cot(5\delta)\sin(2\delta)) \\
&- \frac{1703}{60}(\cos(3\delta) - \cot(5\delta)\sin(3\delta)) + \frac{4913}{240}(\cos(4\delta) - \cot(5\delta)\sin(4\delta)) \\
&- \frac{2\cos(4\delta) + \cos(7\delta) - 2\cot(5\delta)\sin(4\delta) - \cot(5\delta)\sin(7\delta)}{\delta^2}
\end{aligned}
$$

$$
\begin{aligned}
c_{26} =& \frac{1}{120}(-1051)\csc(5\delta)\sin(\delta) + \frac{2599}{120}\csc(5\delta)\sin(2\delta) - \frac{1703}{60}\csc(5\delta)\sin(3\delta) \\
&+ \frac{4913}{240}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(2\sin(4\delta) - 3\sin(5\delta) + \sin(7\delta))}{\delta^2}
\end{aligned}
$$

$$
\begin{aligned}
c_{31} =& \frac{1}{120}(-6797)(\cos(\delta) - \cot(5\delta)\sin(\delta)) + \frac{4097}{30}(\cos(2\delta) - \cot(5\delta)\sin(2\delta)) \\
&- \frac{10331}{60}(\cos(3\delta) - \cot(5\delta)\sin(3\delta)) + \frac{7009}{60}(\cos(4\delta) - \cot(5\delta)\sin(4\delta)) \\
&- \frac{3\cos(4\delta) + \cos(8\delta) - 3\cot(5\delta)\sin(4\delta) - \cot(5\delta)\sin(8\delta)}{\delta^2} \\
c_{36} =& \frac{1}{120}(-6797)\csc(5\delta)\sin(\delta) + \frac{4097}{30}\csc(5\delta)\sin(2\delta) - \frac{10331}{60}\csc(5\delta)\sin(3\delta) \\
&+ \frac{7009}{60}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(3\sin(4\delta) - 4\sin(5\delta) + \sin(8\delta))}{\delta^2} \\
c_{41} =& \frac{1}{12}(-2803)(\cos(\delta) - \cot(5\delta)\sin(\delta)) + \frac{6619}{12}(\cos(2\delta) - \cot(5\delta)\sin(2\delta)) \\
&- \frac{1349}{2}(\cos(3\delta) - \cot(5\delta)\sin(3\delta)) + \frac{3487}{8}(\cos(4\delta) - \cot(5\delta)\sin(4\delta)) \\
&- \frac{4\cos(4\delta) + \cos(9\delta) - 4\cot(5\delta)\sin(4\delta) - \cot(5\delta)\sin(9\delta)}{\delta^2} \\
c_{46} =& \frac{1}{12}(-2803)\csc(5\delta)\sin(\delta) + \frac{6619}{12}\csc(5\delta)\sin(2\delta) - \frac{1349}{2}\csc(5\delta)\sin(3\delta) \\
&+ \frac{3487}{8}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(4\sin(4\delta) - 5\sin(5\delta) + \sin(9\delta))}{\delta^2}
\end{aligned}
$$

$$
\begin{aligned}
c_{51} =& \frac{1}{48}(-35579)(\cos(\delta) - \cot(5\delta)\sin(\delta)) + \frac{20651}{12}(\cos(2\delta) - \cot(5\delta)\sin(2\delta)) \\
& - \frac{49309}{24}(\cos(3\delta) - \cot(5\delta)\sin(3\delta)) + \frac{30715}{24}(\cos(4\delta) - \cot(5\delta)\sin(4\delta)) \\
& - \frac{5\cos(4\delta) + \cos(10\delta) - 5\cot(5\delta)\sin(4\delta) - \cot(5\delta)\sin(10\delta)}{\delta^2} \\
c_{56} =& \frac{1}{48}(-35579)\csc(5\delta)\sin(\delta) + \frac{20651}{12}\csc(5\delta)\sin(2\delta) - \frac{49309}{24}\csc(5\delta)\sin(3\delta) \\
& + \frac{30715}{24}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(5\sin(4\delta) - 6\sin(5\delta) + \sin(10\delta))}{\delta^2} \\
c_{61} =& \frac{1}{120}(-236857)(\cos(\delta) - \cot(5\delta)\sin(\delta)) + \frac{542293}{120}(\cos(2\delta) - \cot(5\delta)\sin(2\delta)) \\
& - \frac{317581}{60}(\cos(3\delta) - \cot(5\delta)\sin(3\delta)) + \frac{769331}{240}(\cos(4\delta) - \cot(5\delta)\sin(4\delta)) \\
& - \frac{6\cos(4\delta) + \cos(11\delta) - 6\cot(5\delta)\sin(4\delta) - \cot(5\delta)\sin(11\delta)}{\delta^2} \\
c_{66} =& \frac{1}{120}(-236857)\csc(5\delta)\sin(\delta) + \frac{542293}{120}\csc(5\delta)\sin(2\delta) - \frac{317581}{60}\csc(5\delta)\sin(3\delta) \\
& + \frac{769331}{240}\csc(5\delta)\sin(4\delta) - \frac{\csc(5\delta)(6\sin(4\delta) - 7\sin(5\delta) + \sin(11\delta))}{\delta^2}
\end{aligned}
$$

Vanished first derivative of phase error, amplification-fitted and phase-fitted: Method $C_2^{(4)}$

$$
\begin{aligned}
c_{11} =& -\frac{-184\cos(\delta) + 109\cos(2\delta) + 135}{160(3\cos(\delta) + 2\cos(3\delta))} \\
c_{15} =& -\Big(- 3312\cos(\delta) + 4020\cos(2\delta) - 1656\cos(3\delta) + 1449\cos(4\delta) - 552\cos(5\delta) \\
& + 109\cos(6\delta) + 2602\Big)/\Big(480(3\cos(\delta) + 2\cos(3\delta))\Big) \\
c_{16} =& \frac{1}{240\delta^2(4\cos(2\delta) + 1)}\Big(- 552\cos(3\delta)\delta^2 + 109\cos(4\delta)\delta^2 + 592\delta^2 \\
& - 48\left(23\delta^2 + 30\right)\cos(\delta) + 20\left(67\delta^2 + 96\right)\cos(2\delta) - 960\cos(3\delta) + 480\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{21} =\Big(& -7414\cos\big(\frac{3\delta}{2}\big)\delta^3 + 994\cos\big(\frac{5\delta}{2}\big)\delta^3 - 4204\cos\big(\frac{7\delta}{2}\big)\delta^3 \\
& + \big(480\delta - 1931\delta^3\big)\cos\big(\frac{\delta}{2}\big) + 480\sin\big(\frac{\delta}{2}\big) \\
& - 480\sin\big(\frac{3\delta}{2}\big)\Big)/\Big(240\delta^3\big(11\cos\big(\frac{\delta}{2}\big) \\
& + 3\big(3\cos\big(\frac{3\delta}{2}\big) + 3\cos\big(\frac{5\delta}{2}\big) + \cos\big(\frac{7\delta}{2}\big) + \cos\big(\frac{9\delta}{2}\big)\big)\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{24} =\Big(& 19114\cos\big(\frac{5\delta}{2}\big)\delta^3 + 22267\cos\big(\frac{7\delta}{2}\big)\delta^3 + 2045\cos\big(\frac{9\delta}{2}\big)\delta^3 \\
& + 4147\cos\big(\frac{11\delta}{2}\big)\delta^3 - 1051\cos\big(\frac{13\delta}{2}\big)\delta^3 + \big(35417\delta^2 - 120\big)\cos\big(\frac{\delta}{2}\big)\delta \\
& + 3\big(13207\delta^2 - 120\big)\cos\big(\frac{3\delta}{2}\big)\delta + 120\cos\big(\frac{5\delta}{2}\big)\delta - 600\cos\big(\frac{7\delta}{2}\big)\delta \\
& + 360\cos\big(\frac{9\delta}{2}\big)\delta + 240\sin\big(\frac{\delta}{2}\big) - 240\sin\big(\frac{3\delta}{2}\big) + 240\sin\big(\frac{5\delta}{2}\big) \\
& - 240\sin\big(\frac{7\delta}{2}\big) + 240\sin\big(\frac{9\delta}{2}\big)\Big)/\Big(120\delta^3\big(11\cos\big(\frac{\delta}{2}\big) \\
& + 3\big(3\cos\big(\frac{3\delta}{2}\big) + 3\cos\big(\frac{5\delta}{2}\big) + \cos\big(\frac{7\delta}{2}\big) + \cos\big(\frac{9\delta}{2}\big)\big)\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{26} = & -\frac{\sec\big(\frac{\delta}{2}\big)}{240\delta^3(18\cos(2\delta) + 6\cos(4\delta) + 11)}\big(-10649\cos\big(\frac{5\delta}{2}\big)\delta^3 \\
& - 6445\cos\big(\frac{7\delta}{2}\big)\delta^3 - 2102\cos\big(\frac{9\delta}{2}\big)\delta^3 - \big(15277\delta^2 + 720\big)\cos\big(\frac{3\delta}{2}\big)\delta \\
& - 1680\cos\big(\frac{5\delta}{2}\big)\delta + 1440\cos\big(\frac{7\delta}{2}\big)\delta + 720\cos\big(\frac{11\delta}{2}\big)\delta + 720\cos\big(\frac{13\delta}{2}\big)\delta \\
& - \delta\big(15277\delta^2 + 1200\big)\cos\big(\frac{\delta}{2}\big) + 480\sin\big(\frac{\delta}{2}\big) - 480\sin\big(\frac{3\delta}{2}\big) + 480\sin\big(\frac{5\delta}{2}\big)\big)
\end{aligned}
$$

$$
\begin{aligned}
c_{31} =& \frac{1}{240\delta^3(3\cos(\delta)+2\cos(3\delta))}\Big(8\delta\big(4097\delta^2\\
&+30\big)\cos(\delta)-3\big(6797\cos(2\delta)\delta^3+7975\delta^3+80\sin(\delta)\big)\Big)\\
c_{35} =& \frac{1}{240\delta^3(3\cos(\delta)+2\cos(3\delta))}\Big(-226740\cos(2\delta)\delta^3+98328\cos(3\delta)\delta^3\\
&-82377\cos(4\delta)\delta^3+32776\cos(5\delta)\delta^3-6797\cos(6\delta)\delta^3-147626\delta^3\\
&+48\big(4097\delta^2-15\big)\cos(\delta)\delta\\
&-720\cos(3\delta)\delta+240\cos(5\delta)\delta+240\sin(5\delta)\Big),\\
c_{36} =& -\frac{\cos(\delta)}{120\delta^3(3\cos(\delta)+2\cos(3\delta))}\big(32776\cos(3\delta)\delta^3-6797\cos(4\delta)\delta^3\\
&-34256\delta^3+16\big(4097\delta^2+60\big)\cos(\delta)\delta-20\big(3779\delta^2+96\big)\cos(2\delta)\delta\\
&+480\cos(3\delta)\delta+480\cos(5\delta)\delta-480\delta-240\sin(\delta)+240\sin(3\delta)\big)
\end{aligned}
$$

$$
\begin{aligned}
c_{41} =& \frac{1}{24\delta^3\big(3\cos(\frac{\delta}{2})+3\cos(\frac{3\delta}{2})+2\big(\cos(\frac{5\delta}{2})+\cos(\frac{7\delta}{2})\big)\big)}\Big(\big(48\delta\\
&-6068\delta^3\big)\cos\big(\frac{\delta}{2}\big)+\delta\big(4829\delta^2+36\big)\cos\big(\frac{3\delta}{2}\big)\\
&-3\big(\delta\big(2803\delta^2-12\big)\cos\big(\frac{5\delta}{2}\big)+8\big(2\sin\big(\frac{\delta}{2}\big)+\sin\big(\frac{3\delta}{2}\big)+\sin\big(\frac{5\delta}{2}\big)\big)\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{45} =& \frac{1}{24\delta^3\big(3\cos(\frac{\delta}{2})+3\cos(\frac{3\delta}{2})+2\big(\cos(\frac{5\delta}{2})+\cos(\frac{7\delta}{2})\big)\big)}\Big(-49950\cos\big(\frac{5\delta}{2}\big)\delta^3\\
&+7023\cos\big(\frac{7\delta}{2}\big)\delta^3-19453\cos\big(\frac{9\delta}{2}\big)\delta^3+10435\cos\big(\frac{11\delta}{2}\big)\delta^3-2803\cos\big(\frac{13\delta}{2}\big)\delta^3\\
&-4\big(9409\delta^2+42\big)\cos\big(\frac{\delta}{2}\big)\delta-12\big(853\delta^2+18\big)\cos\big(\frac{3\delta}{2}\big)\delta-120\cos\big(\frac{5\delta}{2}\big)\delta\\
&-156\cos\big(\frac{7\delta}{2}\big)\delta+36\cos\big(\frac{9\delta}{2}\big)\delta+12\cos\big(\frac{11\delta}{2}\big)\delta+12\cos\big(\frac{13\delta}{2}\big)\delta\\
&+48\sin\big(\frac{\delta}{2}\big)-48\sin\big(\frac{3\delta}{2}\big)+48\sin\big(\frac{5\delta}{2}\big)-24\sin\big(\frac{7\delta}{2}\big)+72\sin\big(\frac{9\delta}{2}\big)\\
&+24\sin\big(\frac{11\delta}{2}\big)+24\sin\big(\frac{13\delta}{2}\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{46} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{24\delta^3(4\cos(2\delta)+1)}\big(-16650\cos\big(\frac{5\delta}{2}\big)\delta^3 \\
&+ 10435\cos\big(\frac{7\delta}{2}\big)\delta^3 - 2803\cos\big(\frac{9\delta}{2}\big)\delta^3 - 12\big(77\delta^2+6\big)\cos\big(\frac{\delta}{2}\big)\delta \\
&- 4\big(853\delta^2+42\big)\cos\big(\frac{3\delta}{2}\big)\delta - 168\cos\big(\frac{5\delta}{2}\big)\delta + 36\cos\big(\frac{7\delta}{2}\big)\delta \\
&+ 36\cos\big(\frac{9\delta}{2}\big)\delta + 48\cos\big(\frac{11\delta}{2}\big)\delta + 48\cos\big(\frac{13\delta}{2}\big)\delta - 48\sin\big(\frac{3\delta}{2}\big) \\
&+ 48\sin\big(\frac{5\delta}{2}\big) + 24\sin\big(\frac{7\delta}{2}\big) + 24\sin\big(\frac{9\delta}{2}\big)\big)
\end{aligned}
$$

$$
\begin{aligned}
c_{51} =& -\frac{1}{96\delta^3(3\cos(\delta)+2\cos(3\delta))}\Big(106737\cos(2\delta)\delta^3 + 120467\delta^3 \\
&- 8\big(20651\delta^2+36\big)\cos(\delta)\delta - 192\cos(3\delta)\delta + 192\sin(\delta) + 96\sin(3\delta)\Big) \\
c_{55} =& \frac{1}{96\delta^3(3\cos(\delta)+2\cos(3\delta))}\Big(- 1101036\cos(2\delta)\delta^3 \\
&+ 495624\cos(3\delta)\delta^3 - 402591\cos(4\delta)\delta^3 + 165208\cos(5\delta)\delta^3 \\
&- 35579\cos(6\delta)\delta^3 - 720294\delta^3 + 48\big(20651\delta^2-30\big)\cos(\delta)\delta \\
&- 960\cos(3\delta)\delta + 96\sin(3\delta) + 288\sin(5\delta) + 96\sin(7\delta)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{56} =& -\frac{1}{48\delta^3(4\cos(2\delta)+1)}\Big(330416\cos(\delta)\delta^3 + 165208\cos(3\delta)\delta^3 - 35579\cos(4\delta)\delta^3 - 169776\delta^3 \\
&- 4\big(91753\delta^2+288\big)\cos(2\delta)\delta + 192\cos(3\delta)\delta + 96\cos(5\delta)\delta + 192\cos(7\delta)\delta \\
&- 288\delta - 96\sin(\delta) + 192\sin(3\delta) + 96\sin(5\delta)\Big) \\
c_{61} =& \Big(- 4\delta\big(124501\delta^2-270\big)\cos\big(\frac{\delta}{2}\big) + 5\delta\big(74803\delta^2+192\big)\cos\big(\frac{3\delta}{2}\big) \\
&- 3\big(\delta\big(236857\delta^2-320\big)\cos\big(\frac{5\delta}{2}\big) + 40\big(2\csc\big(\frac{\delta}{2}\big)\csc(\delta)\sin^3(2\delta) \\
&- 5\delta\cos\big(\frac{7\delta}{2}\big) - 5\delta\cos\big(\frac{9\delta}{2}\big) + 6\sin\big(\frac{\delta}{2}\big)\big)\big)\Big)/\Big(240\delta^3\big(3\cos\big(\frac{\delta}{2}\big) \\
&+ 3\cos\big(\frac{3\delta}{2}\big) + 2\big(\cos\big(\frac{5\delta}{2}\big) + \cos\big(\frac{7\delta}{2}\big)\big)\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{65} = -\Big(&\frac{647307}{20}\cos\big(\frac{5\delta}{2}\big)\delta^3 - \frac{212567}{40}\cos\big(\frac{7\delta}{2}\big)\delta^3 \\
&+ \frac{1531471}{120}\cos\big(\frac{9\delta}{2}\big)\delta^3 - \frac{847729}{120}\cos\big(\frac{11\delta}{2}\big)\delta^3 + \frac{236857}{120}\cos\big(\frac{13\delta}{2}\big)\delta^3 \\
&+ 34\cos\big(\frac{5\delta}{2}\big)\delta + 30\cos\big(\frac{7\delta}{2}\big)\delta + 6\cos\big(\frac{9\delta}{2}\big)\delta + 3\cos\big(\frac{11\delta}{2}\big)\delta \\
&+ 3\cos\big(\frac{13\delta}{2}\big)\delta + \cos\big(\frac{15\delta}{2}\big)\delta + \cos\big(\frac{17\delta}{2}\big)\delta \\
&+ \big(\frac{711959\delta^3}{30} + 51\delta\big)\cos\big(\frac{\delta}{2}\big) + \big(\frac{52507\delta^3}{10} + 46\delta\big)\cos\big(\frac{3\delta}{2}\big) \\
&- 6\sin\big(\frac{\delta}{2}\big) + 4\sin\big(\frac{3\delta}{2}\big) - 8\sin\big(\frac{5\delta}{2}\big) - 12\sin\big(\frac{9\delta}{2}\big) \\
&- 6\sin\big(\frac{11\delta}{2}\big) - 6\sin\big(\frac{13\delta}{2}\big) \\
&- 2\sin\big(\frac{15\delta}{2}\big) - 2\sin\big(\frac{17\delta}{2}\big)\Big)\Big/\Big(2\delta^3\big(3\cos\big(\frac{\delta}{2}\big) + 3\cos\big(\frac{3\delta}{2}\big) \\
&+ 2\big(\cos\big(\frac{5\delta}{2}\big) + \cos\big(\frac{7\delta}{2}\big)\big)\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{66} = -&\frac{\sec\big(\frac{\delta}{2}\big)}{240\delta^3(4\cos(2\delta)+1)}\Big(\big(-1294614\cos\big(\frac{5\delta}{2}\big)\delta^3 + 847729\cos\big(\frac{7\delta}{2}\big)\delta^3 \\
&- 236857\cos\big(\frac{9\delta}{2}\big)\delta^3 - 20\big(2429\delta^2 + 120\big)\cos\big(\frac{\delta}{2}\big)\delta - 4\big(52507\delta^2 + 960\big)\cos\big(\frac{3\delta}{2}\big)\delta \\
&- 3840\cos\big(\frac{5\delta}{2}\big)\delta + 240\cos\big(\frac{7\delta}{2}\big)\delta + 240\cos\big(\frac{9\delta}{2}\big)\delta + 120\cos\big(\frac{11\delta}{2}\big)\delta \\
&+ 120\cos\big(\frac{13\delta}{2}\big)\delta + 480\cos\big(\frac{15\delta}{2}\big)\delta + 480\cos\big(\frac{17\delta}{2}\big)\delta - 480\sin\big(\frac{3\delta}{2}\big) \\
&+ 960\sin\big(\frac{5\delta}{2}\big) + 480\sin\big(\frac{7\delta}{2}\big) + 480\sin\big(\frac{9\delta}{2}\big) \\
&+ 240\sin\big(\frac{11\delta}{2}\big) + 240\sin\big(\frac{13\delta}{2}\big)\big)\Big)
\end{aligned}
$$

Amplification-fitted and phase-fitted with vanished first derivative of amplification error:Method $M^{(5)}$

$$
\begin{aligned}
c_{11} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{480\delta^3(6\cos(2\delta)+3\cos(4\delta)+\cos(6\delta)+5)}\Big(-127\cos\big(\frac{5\delta}{2}\big)\delta^3 \\
&+425\cos\big(\frac{7\delta}{2}\big)\delta^3-167\cos\big(\frac{9\delta}{2}\big)\delta^3+109\cos\big(\frac{11\delta}{2}\big)\delta^3 \\
&+40\big(5\delta^2+6\big)\cos\big(\frac{\delta}{2}\big)\delta+40\big(5\delta^2+6\big)\cos\big(\frac{3\delta}{2}\big)\delta \\
&+240\cos\big(\frac{5\delta}{2}\big)\delta+240\cos\big(\frac{7\delta}{2}\big)\delta+240\cos\big(\frac{9\delta}{2}\big)\delta \\
&-480\sin\big(\frac{\delta}{2}\big)+480\sin\big(\frac{3\delta}{2}\big)-480\sin\big(\frac{5\delta}{2}\big)+480\sin\big(\frac{7\delta}{2}\big)-480\sin\big(\frac{9\delta}{2}\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{15} =&\frac{1}{240\delta^3(4\cos(4\delta)-5\cot(5\delta)\sin(4\delta))}\Big(-109\cos(\delta)\delta^3+552\cos(2\delta)\delta^3 \\
&-1122\cos(3\delta)\delta^3+545\cot(5\delta)\sin(\delta)\delta^3-1380\cot(5\delta)\sin(2\delta)\delta^3+1870\cot(5\delta)\sin(3\delta)\delta^3 \\
&-960\cos(4\delta)\delta-1440\cos(6\delta)\delta+1200\cot(5\delta)\sin(4\delta)\delta+1200\cot(5\delta)\sin(6\delta)\delta \\
&+480\sin(4\delta)-960\sin(5\delta)+480\sin(6\delta)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{16} =&\frac{1}{240\delta^3(4\cos(4\delta)-5\cot(5\delta)\sin(4\delta))}\Big(\csc(5\delta)\sin(4\delta)\big(109\cos(\delta)\delta^3 \\
&+6\big(-92\cos(2\delta)\delta^3+187\cos(3\delta)\delta^3-80(5\delta\cos(5\delta)-3\delta\cos(6\delta)+\sin(4\delta)-2\sin(5\delta) \\
&+\sin(6\delta))\big)\big)-4\delta\cos(4\delta)\big(\csc(5\delta)\big(109\sin(\delta)\delta^2-276\sin(2\delta)\delta^2 \\
&+374\sin(3\delta)\delta^2+240\sin(6\delta)\big)-480\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{21} =& -\Big(\sec\big(\frac{\delta}{2}\big)\big(-1238\cos\big(\frac{5\delta}{2}\big)\delta^3+3960\cos\big(\frac{7\delta}{2}\big)\delta^3 \\
&-1548\cos\big(\frac{9\delta}{2}\big)\delta^3+1051\cos\big(\frac{11\delta}{2}\big)\delta^3+5\big(383\delta^2+72\big)\cos\big(\frac{\delta}{2}\big)\delta \\
&+5\big(383\delta^2+72\big)\cos\big(\frac{3\delta}{2}\big)\delta+360\cos\big(\frac{5\delta}{2}\big)\delta+360\cos\big(\frac{7\delta}{2}\big)\delta \\
&+240\cos\big(\frac{9\delta}{2}\big)\delta+240\cos\big(\frac{11\delta}{2}\big)\delta-240\sin\big(\frac{\delta}{2}\big) \\
&+240\sin\big(\frac{3\delta}{2}\big)-240\sin\big(\frac{5\delta}{2}\big)+240\sin\big(\frac{7\delta}{2}\big)-240\sin\big(\frac{9\delta}{2}\big) \\
&-240\sin\big(\frac{11\delta}{2}\big)\big)\Big)\Big/\Big(240\delta^3(6\cos(2\delta)+3\cos(4\delta)+\cos(6\delta)+5)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{25} =&\frac{1}{120\delta^3(4\cos(4\delta)-5\cot(5\delta)\sin(4\delta))}\Big(-1051\cos(\delta)\delta^3+5198\cos(2\delta)\delta^3\\
&-10218\cos(3\delta)\delta^3+5255\cot(5\delta)\sin(\delta)\delta^3-12995\cot(5\delta)\sin(2\delta)\delta^3\\
&+17030\cot(5\delta)\sin(3\delta)\delta^3-960\cos(4\delta)\delta-840\cos(7\delta)\delta\\
&+1200\cot(5\delta)\sin(4\delta)\delta+600\cot(5\delta)\sin(7\delta)\delta+480\sin(4\delta)\\
&-720\sin(5\delta)+240\sin(7\delta)\Big)\\
c_{26} =&\frac{1}{120\delta^3(4\cos(4\delta)-5\cot(5\delta)\sin(4\delta))}\Big(\csc(5\delta)\sin(4\delta)\big(1051\cos(\delta)\delta^3\\
&-5198\cos(2\delta)\delta^3+10218\cos(3\delta)\delta^3-1800\cos(5\delta)\delta+840\cos(7\delta)\delta-480\sin(4\delta)\\
&+720\sin(5\delta)-240\sin(7\delta)\big)-4\delta\cos(4\delta)\big(\csc(5\delta)\big(1051\sin(\delta)\delta^2\\
&-2599\sin(2\delta)\delta^2+3406\sin(3\delta)\delta^2+120\sin(7\delta)\big)-360\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{31} =&-\frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(6\cos(2\delta)+3\cos(4\delta)+\cos(6\delta)+5)}\left(-8111\cos\left(\frac{5\delta}{2}\right)\delta^3\right.\\
&+24665\cos\left(\frac{7\delta}{2}\right)\delta^3-9591\cos\left(\frac{9\delta}{2}\right)\delta^3+6797\cos\left(\frac{11\delta}{2}\right)\delta^3\\
&+40\big(307\delta^2+18\big)\cos\left(\frac{\delta}{2}\right)\delta+40\big(307\delta^2+18\big)\cos\left(\frac{3\delta}{2}\right)\delta\\
&+720\cos\left(\frac{5\delta}{2}\right)\delta+600\cos\left(\frac{7\delta}{2}\right)\delta+600\cos\left(\frac{9\delta}{2}\right)\delta\\
&+360\cos\left(\frac{11\delta}{2}\right)\delta+360\cos\left(\frac{13\delta}{2}\right)\delta-480\sin\left(\frac{\delta}{2}\right)\\
&+480\sin\left(\frac{3\delta}{2}\right)-480\sin\left(\frac{5\delta}{2}\right)+480\sin\left(\frac{7\delta}{2}\right)-480\sin\left(\frac{9\delta}{2}\right)\\
&\left.-240\sin\left(\frac{11\delta}{2}\right)-240\sin\left(\frac{13\delta}{2}\right)\right)\\
c_{35} =&\frac{1}{120\delta^3(4\cos(4\delta)-5\cot(5\delta)\sin(4\delta))}\Big(-6797\cos(\delta)\delta^3\\
&+32776\cos(2\delta)\delta^3-61986\cos(3\delta)\delta^3+33985\cot(5\delta)\sin(\delta)\delta^3-81940\cot(5\delta)\sin(2\delta)\delta^3\\
&+103310\cot(5\delta)\sin(3\delta)\delta^3-1440\cos(4\delta)\delta-960\cos(8\delta)\delta+1800\cot(5\delta)\sin(4\delta)\delta\\
&+600\cot(5\delta)\sin(8\delta)\delta+720\sin(4\delta)-960\sin(5\delta)+240\sin(8\delta)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{36} =& \frac{1}{120\delta^3(4\cos(4\delta) - 5\cot(5\delta)\sin(4\delta))}\Big(\csc(5\delta)\sin(4\delta)\big(6797\cos(\delta)\delta^3 \\
&- 32776\cos(2\delta)\delta^3 + 61986\cos(3\delta)\delta^3 - 2400\cos(5\delta)\delta + 960\cos(8\delta)\delta \\
&- 720\sin(4\delta) + 960\sin(5\delta) \\
&- 240\sin(8\delta)\big) - 4\delta\cos(4\delta)\big(\csc(5\delta)\big(6797\sin(\delta)\delta^2 - 16388\sin(2\delta)\delta^2 \\
&+ 20662\sin(3\delta)\delta^2 + 120\sin(8\delta)\big) - 480\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{41} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{24\delta^3(6\cos(2\delta) + 3\cos(4\delta) + \cos(6\delta) + 5)}\big(-3354\cos\big(\frac{5\delta}{2}\big)\delta^3 \\
&+ 9884\cos\big(\frac{7\delta}{2}\big)\delta^3 - 3816\cos\big(\frac{9\delta}{2}\big)\delta^3 + 2803\cos\big(\frac{11\delta}{2}\big)\delta^3 \\
&+ 15\big(337\delta^2 + 8\big)\cos\big(\frac{\delta}{2}\big)\delta + 15\big(337\delta^2 + 8\big)\cos\big(\frac{3\delta}{2}\big)\delta \\
&+ 108\cos\big(\frac{5\delta}{2}\big)\delta + 108\cos\big(\frac{7\delta}{2}\big)\delta + 84\cos\big(\frac{9\delta}{2}\big)\delta \\
&+ 84\cos\big(\frac{11\delta}{2}\big)\delta + 48\cos\big(\frac{13\delta}{2}\big)\delta + 48\cos\big(\frac{15\delta}{2}\big)\delta \\
&- 48\sin\big(\frac{\delta}{2}\big) + 48\sin\big(\frac{3\delta}{2}\big) - 48\sin\big(\frac{5\delta}{2}\big) + 48\sin\big(\frac{7\delta}{2}\big) \\
&- 48\sin\big(\frac{9\delta}{2}\big) - 48\sin\big(\frac{11\delta}{2}\big) - 24\sin\big(\frac{13\delta}{2}\big) - 24\sin\big(\frac{15\delta}{2}\big)\big)
\end{aligned}
$$

$$
\begin{aligned}
c_{45} =& \frac{1}{12\delta^3(4\cos(4\delta) - 5\cot(5\delta)\sin(4\delta))}\Big(- 2803\cos(\delta)\delta^3 \\
&+ 13238\cos(2\delta)\delta^3 - 24282\cos(3\delta)\delta^3 + 14015\cot(5\delta)\sin(\delta)\delta^3 - 33095\cot(5\delta)\sin(2\delta)\delta^3 \\
&+ 40470\cot(5\delta)\sin(3\delta)\delta^3 - 192\cos(4\delta)\delta - 108\cos(9\delta)\delta + 240\cot(5\delta)\sin(4\delta)\delta \\
&+ 60\cot(5\delta)\sin(9\delta)\delta + 96\sin(4\delta) - 120\sin(5\delta) + 24\sin(9\delta)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{46} =& \frac{1}{12\delta^3(4\cos(4\delta) - 5\cot(5\delta)\sin(4\delta))}\Big(\csc(5\delta)\sin(4\delta)\big(2803\cos(\delta)\delta^3 \\
&+ 2\big(-6619\cos(2\delta)\delta^3 + 12141\cos(3\delta)\delta^3 - 150\cos(5\delta)\delta + 54\cos(9\delta)\delta - 48\sin(4\delta) \\
&+ 60\sin(5\delta) - 12\sin(9\delta)\big)\big) - 4\delta\cos(4\delta)\big(\csc(5\delta)\big(2803\sin(\delta)\delta^2 \\
&- 6619\sin(2\delta)\delta^2 + 8094\sin(3\delta)\delta^2 + 12\sin(9\delta)\big) - 60\big)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{51} = &-\frac{2\cos^2\left(\frac{\delta}{2}\right)\sin^3\left(\frac{\delta}{2}\right)}{3\delta^3(9\sin(\delta)-\sin(9\delta))}\big(-42457\cos\big(\frac{5\delta}{2}\big)\delta^3\\
&+122751\cos\big(\frac{7\delta}{2}\big)\delta^3-47025\cos\big(\frac{9\delta}{2}\big)\delta^3+35579\cos\big(\frac{11\delta}{2}\big)\delta^3\\
&+40\big(1607\delta^2+18\big)\cos\big(\frac{\delta}{2}\big)\delta+8\big(8035\delta^2+84\big)\cos\big(\frac{3\delta}{2}\big)\delta\\
&+672\cos\big(\frac{5\delta}{2}\big)\delta+576\cos\big(\frac{7\delta}{2}\big)\delta+576\cos\big(\frac{9\delta}{2}\big)\delta\\
&+432\cos\big(\frac{11\delta}{2}\big)\delta+432\cos\big(\frac{13\delta}{2}\big)\delta+240\cos\big(\frac{15\delta}{2}\big)\delta\\
&+240\cos\big(\frac{17\delta}{2}\big)\delta-288\sin\big(\frac{\delta}{2}\big)+288\sin\big(\frac{3\delta}{2}\big)\\
&-288\sin\big(\frac{5\delta}{2}\big)+288\sin\big(\frac{7\delta}{2}\big)-288\sin\big(\frac{9\delta}{2}\big)-192\sin\big(\frac{11\delta}{2}\big)\\
&-192\sin\big(\frac{13\delta}{2}\big)-96\sin\big(\frac{15\delta}{2}\big)-96\sin\big(\frac{17\delta}{2}\big)\big)
\end{aligned}
$$

$$
\begin{aligned}
c_{55} = &\frac{1}{24\delta^3(9\sin(\delta)-\sin(9\delta))}\Big(82604\sin(3\delta)\delta^3-35579\cos(\delta)\sin(5\delta)\delta^3\\
&-295854\cos(3\delta)\sin(5\delta)\delta^3+82604\sin(7\delta)\delta^3+5\big(35579\delta^2\cos(5\delta)\\
&-96\big)\sin(\delta)\delta-480\cos(10\delta)\sin(5\delta)\delta-480\sin(9\delta)\delta\\
&+10\cos(5\delta)\big(-41302\sin(2\delta)\delta^2+49309\sin(3\delta)\delta^2+24(5\sin(4\delta)+\sin(10\delta))\big)\delta\\
&-576\sin^2(5\delta)+480\sin(4\delta)\sin(5\delta)+96\sin(5\delta)\sin(10\delta)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{56} = &\frac{\csc(5\delta)}{24\delta^3(9\sin(\delta)-\sin(9\delta))}\big(2(165208\cos(\delta)-35579)\sin^2(\delta)\delta^3\\
&+35579\cos(\delta)\sin(4\delta)\sin(5\delta)\delta^3+295854\cos(3\delta)\sin(4\delta)\sin(5\delta)\delta^3\\
&-82604\sin(4\delta)\sin(7\delta)\delta^3+165208\sin(2\delta)\sin(9\delta)\delta^3-4\sin(3\delta)(20651\sin(4\delta)\\
&+49309\sin(9\delta))\delta^3+480\cos(10\delta)\sin(4\delta)\sin(5\delta)\delta+576\sin(5\delta)\sin(9\delta)\delta\\
&-720\sin(4\delta)\sin(10\delta)\delta-96\sin(9\delta)\sin(10\delta)\delta-2\sin(\delta)\big(98618\sin(3\delta)\delta^2\\
&+35579\sin(9\delta)\delta^2-288\sin(5\delta)+48\sin(10\delta)\big)\delta+576\sin(4\delta)\sin^2(5\delta)\\
&-480\sin^2(4\delta)\sin(5\delta)-96\sin(4\delta)\sin(5\delta)\sin(10\delta)\big)
\end{aligned}
$$

$$
\begin{aligned}
c_{61} =& \frac{1}{120\delta^3(4\cos(4\delta) - 5\cot(5\delta)\sin(4\delta))} \Big(\delta^3 \cos(\delta)(-710571\cos(4\delta) \\
&+ 947428\cot(5\delta)\sin(4\delta) - 317581) \\
&- \frac{1}{4\cos(2\delta) + 4\cos(4\delta) + 2} (-2169172\cos(2\delta)\delta^3 + 1084586\cos(4\delta)\delta^3 \\
&- 1905486\cos(5\delta)\delta^3 + 1084586\cos(6\delta)\delta^3 + 236857\cos(9\delta)\delta^3 \\
&- 3\big(344489\delta^2 - 160\big)\cos(\delta)\delta + 240\cos(3\delta)\delta + 240\cos(5\delta)\delta \\
&+ 240\cos(7\delta)\delta + 240\cos(9\delta)\delta - 1440\cos(11\delta)\delta + 2880\sin(4\delta) \\
&- 3360\sin(5\delta) + 480\sin(11\delta))\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{65} =& \frac{1}{120\delta^3(4\cos(4\delta) - 5\cot(5\delta)\sin(4\delta))} \Big(- 236857\cos(\delta)\delta^3 + 1084586\cos(2\delta)\delta^3 \\
&- 1905486\cos(3\delta)\delta^3 + 1184285\cot(5\delta)\sin(\delta)\delta^3 - 2711465\cot(5\delta)\sin(2\delta)\delta^3 \\
&+ 3175810\cot(5\delta)\sin(3\delta)\delta^3 - 2880\cos(4\delta)\delta - 1320\cos(11\delta)\delta \\
&+ 3600\cot(5\delta)\sin(4\delta)\delta + 600\cot(5\delta)\sin(11\delta)\delta \\
&+ 1440\sin(4\delta) - 1680\sin(5\delta) + 240\sin(11\delta)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{66} =& \frac{1}{120\delta^3(4\cos(4\delta) - 5\cot(5\delta)\sin(4\delta))} \Big(\csc(5\delta)\sin(4\delta)\big(236857\cos(\delta)\delta^3 \\
&+ 2\big(-542293\cos(2\delta)\delta^3 + 952743\cos(3\delta)\delta^3 - 2100\cos(5\delta)\delta + 660\cos(11\delta)\delta \\
&- 720\sin(4\delta) + 840\sin(5\delta) - 120\sin(11\delta)\big)\big) - 4\delta\cos(4\delta)\big(\csc(5\delta)\big(236857\sin(\delta)\delta^2 \\
&- 542293\sin(2\delta)\delta^2 + 635162\sin(3\delta)\delta^2 + 120\sin(11\delta)\big) - 840\big)\Big)
\end{aligned}
$$

Vanished first derivative of phase error, amplification-fitted and phase-fitted: Method $M^{(6)}$

$$c_{11} = \frac{-109\cos(\delta)\delta^3 + 69\delta^3 + 60\delta - 120\tan\left(\frac{\delta}{2}\right)}{120\delta^3(3\cos(2\delta)+2)}$$

$$\begin{aligned}c_{14} = &-\frac{1}{\delta^3\left(4\cos\left(\frac{\delta}{2}\right)+3\left(\cos\left(\frac{3\delta}{2}\right)+\cos\left(\frac{5\delta}{2}\right)\right)\right)}\Big(-\frac{1}{60}29\cos\left(\frac{5\delta}{2}\right)\delta^3\\ &-\frac{443}{240}\cos\left(\frac{7\delta}{2}\right)\delta^3+\frac{109}{240}\cos\left(\frac{9\delta}{2}\right)\delta^3+4\cos\left(\frac{5\delta}{2}\right)\delta\\ &+4\cos\left(\frac{7\delta}{2}\right)\delta+\left(6\delta-\frac{559\delta^3}{120}\right)\cos\left(\frac{\delta}{2}\right)\\ &+\left(6\delta-\frac{443\delta^3}{60}\right)\cos\left(\frac{3\delta}{2}\right)+12\sin\left(\frac{\delta}{2}\right)-12\sin\left(\frac{3\delta}{2}\right)\\ &+8\sin\left(\frac{5\delta}{2}\right)-8\sin\left(\frac{7\delta}{2}\right)\Big)\end{aligned}$$

$$\begin{aligned}c_{15} = &\frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(3\cos(2\delta)+2)}\Big(-443\cos\left(\frac{5\delta}{2}\right)\delta^3+109\cos\left(\frac{7\delta}{2}\right)\delta^3\\ &-10\left(53\delta^2-132\right)\cos\left(\frac{\delta}{2}\right)\delta-4\left(29\delta^2-270\right)\cos\left(\frac{3\delta}{2}\right)\delta+1080\cos\left(\frac{5\delta}{2}\right)\delta\\ &+360\cos\left(\frac{7\delta}{2}\right)\delta+360\cos\left(\frac{9\delta}{2}\right)\delta-2640\sin\left(\frac{\delta}{2}\right)+2160\sin\left(\frac{3\delta}{2}\right)\\ &-2160\sin\left(\frac{5\delta}{2}\right)+720\sin\left(\frac{7\delta}{2}\right)-720\sin\left(\frac{9\delta}{2}\right)\Big)\end{aligned}$$

$$\begin{aligned}c_{16} = &-\frac{\sec\left(\frac{\delta}{2}\right)}{480\delta^3(3\cos(2\delta)+2)}\Big(109\cos\left(\frac{5\delta}{2}\right)\delta^3\\ &-4\left(29\delta^2-240\right)\cos\left(\frac{\delta}{2}\right)\delta+1440\cos\left(\frac{7\delta}{2}\right)\delta+\left(1440\delta-443\delta^3\right)\cos\left(\frac{3\delta}{2}\right)\\ &+2400\sin\left(\frac{\delta}{2}\right)-2400\sin\left(\frac{3\delta}{2}\right)+1440\sin\left(\frac{5\delta}{2}\right)-1440\sin\left(\frac{7\delta}{2}\right)\Big)\end{aligned}$$

$$
\begin{aligned}
c_{21} =& \frac{2599\delta^3 + \left(480\delta - 4204\delta^3\right)\cos(\delta) - 480\sin(\delta)}{240\delta^3(3\cos(2\delta)+2)} \\
c_{24} =& -\frac{1}{\delta^3\left(4\cos\left(\frac{\delta}{2}\right) + 3\left(\cos\left(\frac{3\delta}{2}\right) + \cos\left(\frac{5\delta}{2}\right)\right)\right)}\Bigg(-\frac{1}{60}497\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
& - \frac{4147}{120}\cos\left(\frac{7\delta}{2}\right)\delta^3 + \frac{1051}{120}\cos\left(\frac{9\delta}{2}\right)\delta^3 + 17\cos\left(\frac{5\delta}{2}\right)\delta \\
& + 8\cos\left(\frac{7\delta}{2}\right)\delta + 8\cos\left(\frac{9\delta}{2}\right)\delta + \left(20\delta - \frac{5141\delta^3}{60}\right)\cos\left(\frac{\delta}{2}\right) \\
& + \left(17\delta - \frac{4147\delta^3}{30}\right)\cos\left(\frac{3\delta}{2}\right) + 8\sin\left(\frac{\delta}{2}\right) - 10\sin\left(\frac{3\delta}{2}\right) \\
& + 2\sin\left(\frac{5\delta}{2}\right) - 8\sin\left(\frac{7\delta}{2}\right) - 8\sin\left(\frac{9\delta}{2}\right)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{25} =& \frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(3\cos(2\delta)+2)}\Bigg(2\Bigg(1051\cos\left(\frac{7\delta}{2}\right)\delta^3 \\
& + 1440\cos\left(\frac{7\delta}{2}\right)\delta + 360\cos\left(\frac{9\delta}{2}\right)\delta + 360\cos\left(\frac{11\delta}{2}\right)\delta \\
& + \left(2040\delta - 994\delta^3\right)\cos\left(\frac{3\delta}{2}\right) + \left(1080\delta - 4147\delta^3\right)\cos\left(\frac{5\delta}{2}\right) \\
& - 1080\sin\left(\frac{\delta}{2}\right) + 600\sin\left(\frac{3\delta}{2}\right) - 1080\sin\left(\frac{5\delta}{2}\right) - 360\sin\left(\frac{7\delta}{2}\right) \\
& - 360\sin\left(\frac{9\delta}{2}\right) - 360\sin\left(\frac{11\delta}{2}\right)\Bigg) - 5\delta\left(1957\delta^2 - 768\right)\cos\left(\frac{\delta}{2}\right)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{26} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(3\cos(2\delta)+2)}\Bigg(1051\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
& - 14\left(71\delta^2 - 120\right)\cos\left(\frac{\delta}{2}\right)\delta - 11\left(377\delta^2 - 120\right)\cos\left(\frac{3\delta}{2}\right)\delta \\
& + 1320\cos\left(\frac{5\delta}{2}\right)\delta + 1080\cos\left(\frac{7\delta}{2}\right)\delta + 1080\cos\left(\frac{9\delta}{2}\right)\delta \\
& + 960\sin\left(\frac{\delta}{2}\right) - 1200\sin\left(\frac{3\delta}{2}\right) + 240\sin\left(\frac{5\delta}{2}\right) \\
& - 720\sin\left(\frac{7\delta}{2}\right) - 720\sin\left(\frac{9\delta}{2}\right)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{31} =& \frac{\sec\left(\frac{\delta}{2}\right)}{120\delta^3(3\cos(2\delta)+2)}\Big(\delta\left(1397\delta^2+240\right)\cos\left(\frac{\delta}{2}\right) \\
&+\left(180\delta-6797\delta^3\right)\cos\left(\frac{3\delta}{2}\right)+60\Big(3\delta\cos\left(\frac{5\delta}{2}\right)-2\Big(2\sin\left(\frac{\delta}{2}\right) \\
&+\sin\left(\frac{3\delta}{2}\right)+\sin\left(\frac{5\delta}{2}\right)\Big)\Big)\Big) \\
c_{34} =& -\frac{1}{\delta^3\left(4\cos\left(\frac{\delta}{2}\right)+3\left(\cos\left(\frac{3\delta}{2}\right)+\cos\left(\frac{5\delta}{2}\right)\right)\right)}\Big(-\frac{1}{30}1397\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&-\frac{25979}{120}\cos\left(\frac{7\delta}{2}\right)\delta^3+\frac{6797}{120}\cos\left(\frac{9\delta}{2}\right)\delta^3+28\cos\left(\frac{5\delta}{2}\right)\delta \\
&+28\cos\left(\frac{7\delta}{2}\right)\delta+12\cos\left(\frac{9\delta}{2}\right)\delta+12\cos\left(\frac{11\delta}{2}\right)\delta \\
&+\left(40\delta-\frac{31567\delta^3}{60}\right)\cos\left(\frac{\delta}{2}\right)+\left(40\delta-\frac{25979\delta^3}{30}\right)\cos\left(\frac{3\delta}{2}\right) \\
&+22\sin\left(\frac{\delta}{2}\right)-26\sin\left(\frac{3\delta}{2}\right)+10\sin\left(\frac{5\delta}{2}\right)-22\sin\left(\frac{7\delta}{2}\right) \\
&-8\sin\left(\frac{9\delta}{2}\right)-8\sin\left(\frac{11\delta}{2}\right)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{35} =& \frac{\sec\left(\frac{\delta}{2}\right)}{120\delta^3(3\cos(2\delta)+2)}\Big(-25979\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&+6797\cos\left(\frac{7\delta}{2}\right)\delta^3-10\left(3017\delta^2-408\right)\cos\left(\frac{\delta}{2}\right)\delta-4\left(1397\delta^2-840\right)\cos\left(\frac{3\delta}{2}\right)\delta \\
&+3360\cos\left(\frac{5\delta}{2}\right)\delta+2160\cos\left(\frac{7\delta}{2}\right)\delta+2160\cos\left(\frac{9\delta}{2}\right)\delta+540\cos\left(\frac{11\delta}{2}\right)\delta \\
&+540\cos\left(\frac{13\delta}{2}\right)\delta-2640\sin\left(\frac{\delta}{2}\right)+1680\sin\left(\frac{3\delta}{2}\right)-2640\sin\left(\frac{5\delta}{2}\right) \\
&-1440\sin\left(\frac{9\delta}{2}\right)-360\sin\left(\frac{11\delta}{2}\right)-360\sin\left(\frac{13\delta}{2}\right)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{36} = &- \frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(3\cos(2\delta)+2)}\Big(6797\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&- 4\left(1397\delta^2-720\right)\cos\left(\frac{\delta}{2}\right)\delta + 1920\cos\left(\frac{5\delta}{2}\right)\delta + 3360\cos\left(\frac{7\delta}{2}\right)\delta \\
&+ 1440\cos\left(\frac{9\delta}{2}\right)\delta + 1440\cos\left(\frac{11\delta}{2}\right)\delta + \left(3360\delta - 25979\delta^3\right)\cos\left(\frac{3\delta}{2}\right) \\
&+ 2160\sin\left(\frac{\delta}{2}\right) - 2640\sin\left(\frac{3\delta}{2}\right) + 960\sin\left(\frac{5\delta}{2}\right) - 1920\sin\left(\frac{7\delta}{2}\right) \\
&- 720\sin\left(\frac{9\delta}{2}\right) - 720\sin\left(\frac{11\delta}{2}\right)\Big)
\end{aligned}
$$

$$
c_{41} = \frac{6619\delta^3 - 4\left(2803\delta^2-36\right)\cos(\delta)\delta + 96\cos(3\delta)\delta - 96\sin(\delta) - 48\sin(3\delta)}{24\delta^3(3\cos(2\delta)+2)}
$$

$$
\begin{aligned}
c_{44} = &- \frac{1}{\delta^3\left(4\cos\left(\frac{\delta}{2}\right) + 3\left(\cos\left(\frac{3\delta}{2}\right) + \cos\left(\frac{5\delta}{2}\right)\right)\right)}\Big(-\frac{1}{6}1013\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&- \frac{10435}{12}\cos\left(\frac{7\delta}{2}\right)\delta^3 + \frac{2803}{12}\cos\left(\frac{9\delta}{2}\right)\delta^3 - \frac{5}{3}\left(2087\delta^2-36\right)\cos\left(\frac{3\delta}{2}\right)\delta \\
&+ 60\cos\left(\frac{5\delta}{2}\right)\delta + 39\cos\left(\frac{7\delta}{2}\right)\delta + 39\cos\left(\frac{9\delta}{2}\right)\delta + 16\cos\left(\frac{11\delta}{2}\right)\delta \\
&+ 16\cos\left(\frac{13\delta}{2}\right)\delta + \left(70\delta - \frac{12461\delta^3}{6}\right)\cos\left(\frac{\delta}{2}\right) + 16\sin\left(\frac{\delta}{2}\right) - 24\sin\left(\frac{3\delta}{2}\right) \\
&- 22\sin\left(\frac{7\delta}{2}\right) - 22\sin\left(\frac{9\delta}{2}\right) - 8\sin\left(\frac{11\delta}{2}\right) - 8\sin\left(\frac{13\delta}{2}\right)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{45} =& \frac{\sec\left(\frac{\delta}{2}\right)}{24\delta^3(3\cos(2\delta)+2)}\Bigg(\left(1248\delta - 23909\delta^3\right)\cos\left(\frac{\delta}{2}\right) \\
&+ 2\Bigg(2803\cos\left(\frac{7\delta}{2}\right)\delta^3 + 540\cos\left(\frac{7\delta}{2}\right)\delta + 288\cos\left(\frac{9\delta}{2}\right)\delta + 288\cos\left(\frac{11\delta}{2}\right)\delta \\
&+ 72\cos\left(\frac{13\delta}{2}\right)\delta + 72\cos\left(\frac{15\delta}{2}\right)\delta + \left(648\delta - 2026\delta^3\right)\cos\left(\frac{3\delta}{2}\right) \\
&+ \left(468\delta - 10435\delta^3\right)\cos\left(\frac{5\delta}{2}\right) - 240\sin\left(\frac{\delta}{2}\right) + 96\sin\left(\frac{3\delta}{2}\right) \\
&- 264\sin\left(\frac{5\delta}{2}\right) - 120\sin\left(\frac{7\delta}{2}\right) - 144\sin\left(\frac{9\delta}{2}\right) \\
&- 144\sin\left(\frac{11\delta}{2}\right) - 36\sin\left(\frac{13\delta}{2}\right) - 36\sin\left(\frac{15\delta}{2}\right)\Bigg)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{46} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{24\delta^3(3\cos(2\delta)+2)}\Bigg(2803\cos\left(\frac{5\delta}{2}\right)\delta^3 + 468\cos\left(\frac{5\delta}{2}\right)\delta \\
&+ 432\cos\left(\frac{7\delta}{2}\right)\delta + 432\cos\left(\frac{9\delta}{2}\right)\delta + 180\cos\left(\frac{11\delta}{2}\right)\delta + 180\cos\left(\frac{13\delta}{2}\right)\delta \\
&+ \left(480\delta - 2026\delta^3\right)\cos\left(\frac{\delta}{2}\right) + \left(468\delta - 10435\delta^3\right)\cos\left(\frac{3\delta}{2}\right) + 192\sin\left(\frac{\delta}{2}\right) \\
&- 264\sin\left(\frac{3\delta}{2}\right) + 24\sin\left(\frac{5\delta}{2}\right) - 192\sin\left(\frac{7\delta}{2}\right) - 192\sin\left(\frac{9\delta}{2}\right) \\
&- 72\sin\left(\frac{11\delta}{2}\right) - 72\sin\left(\frac{13\delta}{2}\right)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{51} =& \frac{\sec\left(\frac{\delta}{2}\right)}{48\delta^3(3\cos(2\delta)+2)}\Bigg(\delta\left(5723\delta^2 + 216\right)\cos\left(\frac{\delta}{2}\right) \\
&+ \left(192\delta - 35579\delta^3\right)\cos\left(\frac{3\delta}{2}\right) + 24\Bigg(8\delta\cos\left(\frac{5\delta}{2}\right) + 5\delta\cos\left(\frac{7\delta}{2}\right) \\
&+ 5\delta\cos\left(\frac{9\delta}{2}\right) - 6\sin\left(\frac{\delta}{2}\right) - 4\sin\left(\frac{3\delta}{2}\right) - 4\sin\left(\frac{5\delta}{2}\right) \\
&- 2\sin\left(\frac{7\delta}{2}\right) - 2\sin\left(\frac{9\delta}{2}\right)\Bigg)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{54} =& -\frac{1}{\delta^3\left(4\cos\left(\frac{\delta}{2}\right)+3\left(\cos\left(\frac{3\delta}{2}\right)+\cos\left(\frac{5\delta}{2}\right)\right)\right)}\Bigg(-\frac{1}{12}5723\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
& -\frac{129629}{48}\cos\left(\frac{7\delta}{2}\right)\delta^3+\frac{35579}{48}\cos\left(\frac{9\delta}{2}\right)\delta^3+2\left(50-\frac{152521\delta^2}{48}\right)\cos\left(\frac{\delta}{2}\right)\delta \\
& +4\left(25-\frac{129629\delta^2}{48}\right)\cos\left(\frac{3\delta}{2}\right)\delta+80\cos\left(\frac{5\delta}{2}\right)\delta+80\cos\left(\frac{7\delta}{2}\right)\delta+50\cos\left(\frac{9\delta}{2}\right)\delta \\
& +50\cos\left(\frac{11\delta}{2}\right)\delta+20\cos\left(\frac{13\delta}{2}\right)\delta+20\cos\left(\frac{15\delta}{2}\right)\delta+30\sin\left(\frac{\delta}{2}\right) \\
& -42\sin\left(\frac{3\delta}{2}\right)+8\sin\left(\frac{5\delta}{2}\right)-40\sin\left(\frac{7\delta}{2}\right)-22\sin\left(\frac{9\delta}{2}\right) \\
& -22\sin\left(\frac{11\delta}{2}\right)-8\sin\left(\frac{13\delta}{2}\right)-8\sin\left(\frac{15\delta}{2}\right)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{55} =& \frac{\sec\left(\frac{\delta}{2}\right)}{48\delta^3(3\cos(2\delta)+2)}\Bigg(-129629\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
& +35579\cos\left(\frac{7\delta}{2}\right)\delta^3-2\left(73399\delta^2-1860\right)\cos\left(\frac{\delta}{2}\right)\delta \\
& -4\left(5723\delta^2-870\right)\cos\left(\frac{3\delta}{2}\right)\delta+3480\cos\left(\frac{5\delta}{2}\right)\delta+2760\cos\left(\frac{7\delta}{2}\right)\delta \\
& +2760\cos\left(\frac{9\delta}{2}\right)\delta+1440\cos\left(\frac{11\delta}{2}\right)\delta+1440\cos\left(\frac{13\delta}{2}\right)\delta+360\cos\left(\frac{15\delta}{2}\right)\delta \\
& +360\cos\left(\frac{17\delta}{2}\right)\delta-1584\sin\left(\frac{\delta}{2}\right)+816\sin\left(\frac{3\delta}{2}\right)-1776\sin\left(\frac{5\delta}{2}\right) \\
& -336\sin\left(\frac{7\delta}{2}\right)-1200\sin\left(\frac{9\delta}{2}\right)-576\sin\left(\frac{11\delta}{2}\right)-576\sin\left(\frac{13\delta}{2}\right) \\
& -144\sin\left(\frac{15\delta}{2}\right)-144\sin\left(\frac{17\delta}{2}\right)\Bigg)
\end{aligned}
$$

$$
\begin{aligned}
c_{56} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{96\delta^3(3\cos(2\delta)+2)}\Big(35579\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&-4\left(5723\delta^2-672\right)\cos\left(\frac{\delta}{2}\right)\delta+2400\cos\left(\frac{5\delta}{2}\right)\delta+3264\cos\left(\frac{7\delta}{2}\right)\delta \\
&+2112\cos\left(\frac{9\delta}{2}\right)\delta+2112\cos\left(\frac{11\delta}{2}\right)\delta+864\cos\left(\frac{13\delta}{2}\right)\delta+864\cos\left(\frac{15\delta}{2}\right)\delta \\
&+\left(2976\delta-129629\delta^3\right)\cos\left(\frac{3\delta}{2}\right)+1248\sin\left(\frac{\delta}{2}\right)-1632\sin\left(\frac{3\delta}{2}\right) \\
&+384\sin\left(\frac{5\delta}{2}\right)-1344\sin\left(\frac{7\delta}{2}\right)-768\sin\left(\frac{9\delta}{2}\right)-768\sin\left(\frac{11\delta}{2}\right) \\
&-288\sin\left(\frac{13\delta}{2}\right)-288\sin\left(\frac{15\delta}{2}\right)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{61} =& \frac{1}{240\delta^3(3\cos(2\delta)+2)}\Big(542293\delta^3-4\left(236857\delta^2-720\right)\cos(\delta)\delta \\
&+2400\cos(3\delta)\delta+1440\cos(5\delta)\delta-1440\sin(\delta)-960\sin(3\delta)-480\sin(5\delta)\Big) \\
c_{64} =& -\frac{1}{\delta^3\left(4\cos\left(\frac{\delta}{2}\right)+3\left(\cos\left(\frac{3\delta}{2}\right)+\cos\left(\frac{5\delta}{2}\right)\right)\right)}\Big(-\frac{1}{60}68579\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&-\frac{847729}{120}\cos\left(\frac{7\delta}{2}\right)\delta^3+\frac{236857}{120}\cos\left(\frac{9\delta}{2}\right)\delta^3+2\left(70-\frac{984887\delta^2}{120}\right)\cos\left(\frac{\delta}{2}\right)\delta \\
&+2\left(65-\frac{847729\delta^2}{60}\right)\cos\left(\frac{3\delta}{2}\right)\delta+130\cos\left(\frac{5\delta}{2}\right)\delta+100\cos\left(\frac{7\delta}{2}\right)\delta+100\cos\left(\frac{9\delta}{2}\right)\delta \\
&+61\cos\left(\frac{11\delta}{2}\right)\delta+61\cos\left(\frac{13\delta}{2}\right)\delta+24\cos\left(\frac{15\delta}{2}\right)\delta+24\cos\left(\frac{17\delta}{2}\right)\delta+24\sin\left(\frac{\delta}{2}\right) \\
&-40\sin\left(\frac{3\delta}{2}\right)-4\sin\left(\frac{5\delta}{2}\right)-40\sin\left(\frac{7\delta}{2}\right)-40\sin\left(\frac{9\delta}{2}\right)-22\sin\left(\frac{11\delta}{2}\right) \\
&-22\sin\left(\frac{13\delta}{2}\right)-8\sin\left(\frac{15\delta}{2}\right)-8\sin\left(\frac{17\delta}{2}\right)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{65} =& \frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(3\cos(2\delta)+2)}\Big(2\Big(236857\cos\left(\frac{7\delta}{2}\right)\delta^3 \\
&- 2\left(68579\delta^2-6360\right)\cos\left(\frac{3\delta}{2}\right)\delta + 12000\cos\left(\frac{7\delta}{2}\right)\delta + 8400\cos\left(\frac{9\delta}{2}\right)\delta \\
&+ 8400\cos\left(\frac{11\delta}{2}\right)\delta + 4320\cos\left(\frac{13\delta}{2}\right)\delta + 4320\cos\left(\frac{15\delta}{2}\right)\delta \\
&+ 1080\cos\left(\frac{17\delta}{2}\right)\delta + 1080\cos\left(\frac{19\delta}{2}\right)\delta + \left(10920\delta-847729\delta^3\right)\cos\left(\frac{5\delta}{2}\right) \\
&- 3720\sin\left(\frac{\delta}{2}\right) + 1320\sin\left(\frac{3\delta}{2}\right) - 4440\sin\left(\frac{5\delta}{2}\right) - 2280\sin\left(\frac{7\delta}{2}\right) \\
&- 3000\sin\left(\frac{9\delta}{2}\right) - 3000\sin\left(\frac{11\delta}{2}\right) - 1440\sin\left(\frac{13\delta}{2}\right) - 1440\sin\left(\frac{15\delta}{2}\right) \\
&- 360\sin\left(\frac{17\delta}{2}\right) - 360\sin\left(\frac{19\delta}{2}\right)\Big) - 5\delta\left(380239\delta^2-4944\right)\cos\left(\frac{\delta}{2}\right)\Big)
\end{aligned}
$$

$$
\begin{aligned}
c_{66} =& -\frac{\sec\left(\frac{\delta}{2}\right)}{240\delta^3(3\cos(2\delta)+2)}\Big(236857\cos\left(\frac{5\delta}{2}\right)\delta^3 \\
&- 2\left(68579\delta^2-4680\right)\cos\left(\frac{\delta}{2}\right)\delta + 9480\cos\left(\frac{5\delta}{2}\right)\delta \\
&+ 9840\cos\left(\frac{7\delta}{2}\right)\delta + 9840\cos\left(\frac{9\delta}{2}\right)\delta + 6240\cos\left(\frac{11\delta}{2}\right)\delta \\
&+ 6240\cos\left(\frac{13\delta}{2}\right)\delta + 2520\cos\left(\frac{15\delta}{2}\right)\delta + 2520\cos\left(\frac{17\delta}{2}\right)\delta \\
&+ \left(9480\delta-847729\delta^3\right)\cos\left(\frac{3\delta}{2}\right) + 2880\sin\left(\frac{\delta}{2}\right) \\
&- 4080\sin\left(\frac{3\delta}{2}\right) + 240\sin\left(\frac{5\delta}{2}\right) - 3360\sin\left(\frac{7\delta}{2}\right) - 3360\sin\left(\frac{9\delta}{2}\right) \\
&- 1920\sin\left(\frac{11\delta}{2}\right) - 1920\sin\left(\frac{13\delta}{2}\right) - 720\sin\left(\frac{15\delta}{2}\right) - 720\sin\left(\frac{17\delta}{2}\right)\Big)
\end{aligned}
$$