

## THE CENTER OF HECKE-CLIFFORD SUPERALGERA

Got 48 basis.

Got basis 1:  $1$ ,

Got basis 2:  $T_1$ ,

Got basis 3:  $T_2$ ,

Got basis 4:  $c_1$ ,

Got basis 5:  $c_2$ ,

Got basis 6:  $c_3$ ,

Got basis 7:  $T_1T_2$ ,

Got basis 8:  $T_2T_1$ ,

Got basis 9:  $T_2c_1$ ,

Got basis 10:  $T_2c_2$ ,

Got basis 11:  $T_2c_3$ ,

Got basis 12:  $T_1c_1$ ,

Got basis 13:  $c_1c_2$ ,

Got basis 14:  $c_1c_3$ ,

Got basis 15:  $T_1c_2$ ,

Got basis 16:  $c_2c_3$ ,

Got basis 17:  $T_1c_3$ ,

Got basis 18:  $T_2T_1c_3$ ,

Got basis 19:  $T_1c_1c_2$ ,

Got basis 20:  $T_2c_1c_2$ ,

Got basis 21:  $T_2c_1c_3$ ,

Got basis 22:  $T_1c_1c_3$ ,

Got basis 23:  $T_2c_2c_3$ ,

Got basis 24:  $T_1T_2c_1$ ,

Got basis 25:  $T_1c_2c_3$ ,

Got basis 26:  $T_1T_2c_2$ ,

Got basis 27:  $c_1c_2c_3$ ,

Got basis 28:  $T_1T_2c_3$ ,

Got basis 29:  $T_1T_2T_1$ ,

Got basis 30:  $T_2T_1c_1$ ,

Got basis 31:  $T_2T_1c_2$ ,

Got basis 32:  $T_1T_2T_1c_1$ ,

Got basis 33:  $T_1T_2c_1c_2$ ,

Got basis 34:  $T_1c_1c_2c_3$ ,

Got basis 35:  $T_2T_1c_1c_2$ ,

Got basis 36:  $T_2T_1c_1c_3$ ,

Got basis 37:  $T_1T_2c_1c_3$ ,

Got basis 38:  $T_2T_1c_2c_3$ ,

Got basis 39:  $T_1T_2T_1c_2$ ,

Got basis 40:  $T_1T_2c_2c_3$ ,

Got basis 41:  $T_1T_2T_1c_3$ ,

Got basis 42:  $T_2c_1c_2c_3$ ,

Got basis 43:  $T_1T_2T_1c_2c_3$ ,  
 Got basis 44:  $T_2T_1c_1c_2c_3$ ,  
 Got basis 45:  $T_1T_2c_1c_2c_3$ ,  
 Got basis 46:  $T_1T_2T_1c_1c_3$ ,  
 Got basis 47:  $T_1T_2T_1c_1c_2$ ,  
 Got basis 48:  $T_1T_2T_1c_1c_2c_3$ ,  
 Assume  $z$  is in center, and

$$\begin{aligned}
 z = & a_1 + a_2T_1 + a_3T_2 + a_4c_1 + a_5c_2 + a_6c_3 + a_7T_1T_2 + a_8T_2T_1 + a_9T_2c_1 \\
 & + a_{10}T_2c_2 + a_{11}T_2c_3 + a_{12}T_1c_1 + a_{13}c_1c_2 + a_{14}c_1c_3 + a_{15}T_1c_2 + a_{16}c_2c_3 \\
 & + a_{17}T_1c_3 + a_{18}T_2T_1c_3 + a_{19}T_1c_1c_2 + a_{20}T_2c_1c_2 + a_{21}T_2c_1c_3 + a_{22}T_1c_1c_3 \\
 & + a_{23}T_2c_2c_3 + a_{24}T_1T_2c_1 + a_{25}T_1c_2c_3 + a_{26}T_1T_2c_2 + a_{27}c_1c_2c_3 \\
 & + a_{28}T_1T_2c_3 + a_{29}T_1T_2T_1 + a_{30}T_2T_1c_1 + a_{31}T_2T_1c_2 + a_{32}T_1T_2T_1c_1 \\
 & + a_{33}T_1T_2c_1c_2 + a_{34}T_1c_1c_2c_3 + a_{35}T_2T_1c_1c_2 + a_{36}T_2T_1c_1c_3 \\
 & + a_{37}T_1T_2c_1c_3 + a_{38}T_2T_1c_2c_3 + a_{39}T_1T_2T_1c_2 + a_{40}T_1T_2c_2c_3 \\
 & + a_{41}T_1T_2T_1c_3 + a_{42}T_2c_1c_2c_3 + a_{43}T_1T_2T_1c_2c_3 + a_{44}T_2T_1c_1c_2c_3 \\
 & + a_{45}T_1T_2c_1c_2c_3 + a_{46}T_1T_2T_1c_1c_3 + a_{47}T_1T_2T_1c_1c_2 + a_{48}T_1T_2T_1c_1c_2c_3
 \end{aligned}$$

Round 2, Calculating  $T_1z = zT_1$ , We got 48 equations .  
 Totally 8 solutions, dup count: 0.

$$\begin{aligned}
 a_{19} &= 0 \\
 a_{13} &= 0 \\
 a_{34} &= 0 \\
 a_{27} &= 0 \\
 a_9 &= qa_{39} \\
 a_{20} &= -qa_{47} \\
 a_{21} &= qa_{43} \\
 a_{42} &= -qa_{48}
 \end{aligned}$$

Center:

$$\begin{aligned}
 z = & a_1 + a_2T_1 + a_3T_2 + a_4c_1 + a_5c_2 + a_6c_3 + a_7T_1T_2 + a_8T_2T_1 + qa_{39}T_2c_1 \\
 & + a_{10}T_2c_2 + a_{11}T_2c_3 + a_{12}T_1c_1 + a_{14}c_1c_3 + a_{15}T_1c_2 + a_{16}c_2c_3 + a_{17}T_1c_3 \\
 & + a_{18}T_2T_1c_3 - qa_{47}T_2c_1c_2 + qa_{43}T_2c_1c_3 + a_{22}T_1c_1c_3 + a_{23}T_2c_2c_3 \\
 & + a_{24}T_1T_2c_1 + a_{25}T_1c_2c_3 + a_{26}T_1T_2c_2 + a_{28}T_1T_2c_3 + a_{29}T_1T_2T_1 \\
 & + a_{30}T_2T_1c_1 + a_{31}T_2T_1c_2 + a_{32}T_1T_2T_1c_1 + a_{33}T_1T_2c_1c_2 + a_{35}T_2T_1c_1c_2 \\
 & + a_{36}T_2T_1c_1c_3 + a_{37}T_1T_2c_1c_3 + a_{38}T_2T_1c_2c_3 + a_{39}T_1T_2T_1c_2 \\
 & + a_{40}T_1T_2c_2c_3 + a_{41}T_1T_2T_1c_3 - qa_{48}T_2c_1c_2c_3 + a_{43}T_1T_2T_1c_2c_3 \\
 & + a_{44}T_2T_1c_1c_2c_3 + a_{45}T_1T_2c_1c_2c_3 + a_{46}T_1T_2T_1c_1c_3 + a_{47}T_1T_2T_1c_1c_2 \\
 & + a_{48}T_1T_2T_1c_1c_2c_3
 \end{aligned}$$

Round 3, Calculating  $T_2z = zT_2$ , We got 48 equations .

Totally 20 solutions, dup count: 0.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= qa_{39} \\
a_{20} &= -qa_{47} \\
a_{21} &= -qa_{47} \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= -qa_{47} + q^2a_{47} \\
a_{15} &= qa_{41} \\
a_{43} &= -a_{47} \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{30} \\
a_{35} &= a_{37} \\
a_{33} &= a_{36} \\
a_{44} &= -a_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 + a_2T_1 + a_3T_2 + a_4c_1 + a_5c_2 + a_6c_3 + a_7T_1T_2 + a_8T_2T_1 + qa_{39}T_2c_1 \\
& + a_{10}T_2c_2 + a_{11}T_2c_3 + a_{12}T_1c_1 - qa_{47}c_1c_3 + q^2a_{47}c_1c_3 + qa_{41}T_1c_2 \\
& + a_{17}T_1c_3 + a_{18}T_2T_1c_3 - qa_{47}T_2c_1c_2 - qa_{47}T_2c_1c_3 + a_{22}T_1c_1c_3 \\
& + a_{30}T_1T_2c_1 - qa_{43}T_1c_2c_3 + a_{26}T_1T_2c_2 + a_{28}T_1T_2c_3 + a_{29}T_1T_2T_1 \\
& + a_{30}T_2T_1c_1 + a_{31}T_2T_1c_2 + a_{32}T_1T_2T_1c_1 + a_{36}T_1T_2c_1c_2 + a_{37}T_2T_1c_1c_2 \\
& + a_{36}T_2T_1c_1c_3 + a_{37}T_1T_2c_1c_3 + a_{38}T_2T_1c_2c_3 + a_{39}T_1T_2T_1c_2 \\
& + a_{40}T_1T_2c_2c_3 + a_{41}T_1T_2T_1c_3 - a_{47}T_1T_2T_1c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3 + a_{47}T_1T_2T_1c_1c_2
\end{aligned}$$

Round 4, Calculating  $c_1z = zc_1$ , We got 37 equations .

Totally 26 solutions, dup count: 0.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= qa_{39} \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= qa_{41} \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{30} \\
a_{35} &= a_{37} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= a_{37} \\
a_{28} &= a_{30} \\
a_{26} &= a_{45} \\
a_{32} &= a_{41} \\
a_{36} &= a_{40}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 + a_2T_1 + a_3T_2 + a_4c_1 + a_5c_2 + a_6c_3 + a_{37}T_1T_2 + a_8T_2T_1 + qa_{39}T_2c_1 \\
& + a_{10}T_2c_2 + a_{11}T_2c_3 + a_{12}T_1c_1 + qa_{41}T_1c_2 + a_{17}T_1c_3 + a_{18}T_2T_1c_3 \\
& + a_{22}T_1c_1c_3 + a_{30}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{30}T_1T_2c_3 + a_{29}T_1T_2T_1 \\
& + a_{30}T_2T_1c_1 + a_{31}T_2T_1c_2 + a_{41}T_1T_2T_1c_1 + a_{40}T_1T_2c_1c_2 + a_{37}T_2T_1c_1c_2 \\
& + a_{40}T_2T_1c_1c_3 + a_{37}T_1T_2c_1c_3 + a_{38}T_2T_1c_2c_3 + a_{39}T_1T_2T_1c_2 \\
& + a_{40}T_1T_2c_2c_3 + a_{41}T_1T_2T_1c_3 - a_{45}T_2T_1c_1c_2c_3 + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 5, Calculating  $c_2z = zc_2$ , We got 31 equations .

Totally 33 solutions, dup count: 0.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= qa_{39} \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= a_{11} \\
a_8 &= a_{38} \\
a_{18} &= a_{31} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 + a_2T_1 + a_4c_1 + a_5c_2 + a_6c_3 - a_{40}T_1T_2 + a_{38}T_2T_1 + qa_{39}T_2c_1 + a_{11}T_2c_2 \\
& + a_{11}T_2c_3 + a_{12}T_1c_1 + a_{17}T_1c_3 + a_{31}T_2T_1c_3 + a_{22}T_1c_1c_3 + a_{45}T_1T_2c_1
\end{aligned}$$

$$\begin{aligned}
& + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 + a_{29}T_1T_2T_1 + a_{45}T_2T_1c_1 + a_{31}T_2T_1c_2 \\
& + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 - a_{40}T_1T_2c_1c_3 \\
& + a_{38}T_2T_1c_2c_3 + a_{39}T_1T_2T_1c_2 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 6, Calculating  $c_3z = zc_3$ , We got 26 equations .  
 Totally 39 solutions, dup count: 0.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= qa_{39} \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= a_{11} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 + a_2T_1 + a_6c_3 - a_{40}T_1T_2 - a_{40}T_2T_1 + qa_{39}T_2c_1 + a_{11}T_2c_2 + a_{11}T_2c_3 \\
& + a_{17}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 + a_{29}T_1T_2T_1 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{39}T_1T_2T_1c_2 + a_{40}T_1T_2c_2c_3 \\
& - a_{45}T_2T_1c_1c_2c_3 + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 7, Calculating  $T_1T_2z = zT_1T_2$ , We got 38 equations .

Totally 43 solutions, dup count: 0.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40}
\end{aligned}$$

$$\begin{aligned}
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= a_{11} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= a_{11} - qa_{11}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + a_{11}c_3 - qa_{11}c_3 - a_{40}T_1T_2 - a_{40}T_2T_1 + a_{11}T_2c_2 \\
& + a_{11}T_2c_3 + a_{17}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 8, Calculating  $T_2T_1z = zT_2T_1$ , We got 34 equations .

Totally 45 solutions, dup count: 0.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0
\end{aligned}$$



$$\begin{aligned}
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 9, Calculating  $T_2c_1z = zT_2c_1$ , We got 29 equations .

Totally 45 solutions, dup count: 1.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

$$\begin{aligned}
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 10, Calculating  $T_2c_2z = zT_2c_2$ , We got 29 equations .  
 Totally 45 solutions, dup count: 2.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3
\end{aligned}$$

$$\begin{aligned}
& -2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 11, Calculating  $T_2c_3z = zT_2c_3$ , We got 29 equations .  
 Totally 45 solutions, dup count: 3.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 12, Calculating  $T_1c_1z = zT_1c_1$ , We got 28 equations .  
 Totally 45 solutions, dup count: 4.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3
\end{aligned}$$

$$+ a_{45}T_1T_2c_1c_2c_3$$

Round 13, Calculating  $c_1c_2z = zc_1c_2$ , We got 22 equations .  
Totally 45 solutions, dup count: 5.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0
\end{aligned}$$



$$\begin{aligned}
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 14, Calculating  $c_1c_3z = zc_1c_3$ , We got 22 equations .

Totally 45 solutions, dup count: 6.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 15, Calculating  $T_1c_2z = zT_1c_2$ , We got 28 equations .  
 Totally 45 solutions, dup count: 7.

$$a_{19} = 0$$

$$a_{13} = 0$$

$$a_{34} = 0$$

$$a_{27} = 0$$

$$a_9 = 0$$

$$a_{20} = 0$$

$$a_{21} = 0$$

$$a_{42} = 0$$

$$a_{23} = 0$$

$$a_{16} = 0$$

$$a_{48} = 0$$

$$a_{46} = 0$$

$$a_{14} = 0$$

$$a_{15} = 0$$

$$a_{43} = 0$$

$$a_{25} = -qa_{43}$$

$$a_{24} = a_{45}$$

$$a_{35} = -a_{40}$$

$$a_{33} = a_{40}$$

$$a_{44} = -a_{45}$$

$$a_{47} = 0$$

$$a_7 = -a_{40}$$

$$a_{28} = a_{45}$$

$$a_{26} = a_{45}$$

$$a_{32} = 0$$

$$a_{36} = a_{40}$$

$$a_3 = 0$$

$$a_{41} = 0$$

$$a_{10} = 2a_{45} - 2qa_{45}$$

$$a_8 = -a_{40}$$

$$a_{18} = a_{45}$$

$$a_{30} = a_{45}$$

$$a_{37} = -a_{40}$$

$$a_4 = 0$$

$$a_5 = 0$$

$$a_{12} = 0$$

$$a_{22} = 0$$

$$a_{38} = -a_{40}$$

$$\begin{aligned}
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 16, Calculating  $c_2c_3z = zc_2c_3$ , We got 22 equations .  
 Totally 45 solutions, dup count: 8.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 17, Calculating  $T_1c_3z = zT_1c_3$ , We got 28 equations .  
Totally 45 solutions, dup count: 9.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0
\end{aligned}$$

$$\begin{aligned}
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 18, Calculating  $T_2T_1c_3z = zT_2T_1c_3$ , We got 34 equations .  
 Totally 45 solutions, dup count: 10.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 19, Calculating  $T_1c_1c_2z = zT_1c_1c_2$ , We got 28 equations .  
 Totally 45 solutions, dup count: 11.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0
\end{aligned}$$



$$a_{20} = 0$$

$$a_{21} = 0$$

$$a_{42} = 0$$

$$a_{23} = 0$$

$$a_{16} = 0$$

$$a_{48} = 0$$

$$a_{46} = 0$$

$$a_{14} = 0$$

$$a_{15} = 0$$

$$a_{43} = 0$$

$$a_{25} = -qa_{43}$$

$$a_{24} = a_{45}$$

$$a_{35} = -a_{40}$$

$$a_{33} = a_{40}$$

$$a_{44} = -a_{45}$$

$$a_{47} = 0$$

$$a_7 = -a_{40}$$

$$a_{28} = a_{45}$$

$$a_{26} = a_{45}$$

$$a_{32} = 0$$

$$a_{36} = a_{40}$$

$$a_3 = 0$$

$$a_{41} = 0$$

$$a_{10} = 2a_{45} - 2qa_{45}$$

$$a_8 = -a_{40}$$

$$a_{18} = a_{45}$$

$$a_{30} = a_{45}$$

$$a_{37} = -a_{40}$$

$$a_4 = 0$$

$$a_5 = 0$$

$$a_{12} = 0$$

$$a_{22} = 0$$

$$a_{38} = -a_{40}$$

$$a_{31} = a_{45}$$

$$a_{29} = 0$$

$$a_{39} = 0$$

$$a_2 = -2a_{40} + 2qa_{40}$$

$$a_6 = 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45}$$

$$a_{11} = 2a_{45} - 2qa_{45}$$

$$a_{17} = 2a_{45} - 2qa_{45}$$

Center:

$$\begin{aligned} z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\ & - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\ & - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\ & + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\ & - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\ & + a_{45}T_1T_2c_1c_2c_3 \end{aligned}$$

Round 20, Calculating  $T_2c_1c_2z = zT_2c_1c_2$ , We got 29 equations .

Totally 45 solutions, dup count: 12.

$$\begin{aligned} a_{19} &= 0 \\ a_{13} &= 0 \\ a_{34} &= 0 \\ a_{27} &= 0 \\ a_9 &= 0 \\ a_{20} &= 0 \\ a_{21} &= 0 \\ a_{42} &= 0 \\ a_{23} &= 0 \\ a_{16} &= 0 \\ a_{48} &= 0 \\ a_{46} &= 0 \\ a_{14} &= 0 \\ a_{15} &= 0 \\ a_{43} &= 0 \\ a_{25} &= -qa_{43} \\ a_{24} &= a_{45} \\ a_{35} &= -a_{40} \\ a_{33} &= a_{40} \\ a_{44} &= -a_{45} \\ a_{47} &= 0 \\ a_7 &= -a_{40} \\ a_{28} &= a_{45} \\ a_{26} &= a_{45} \\ a_{32} &= 0 \\ a_{36} &= a_{40} \\ a_3 &= 0 \end{aligned}$$

$$\begin{aligned}
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 21, Calculating  $T_2c_1c_3z = zT_2c_1c_3$ , We got 29 equations .  
 Totally 45 solutions, dup count: 13.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 22, Calculating  $T_1c_1c_3z = zT_1c_1c_3$ , We got 28 equations .

Totally 45 solutions, dup count: 14.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

$$\begin{aligned}
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 23, Calculating  $T_2c_2c_3z = zT_2c_2c_3$ , We got 29 equations .  
 Totally 45 solutions, dup count: 15.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3
\end{aligned}$$

$$\begin{aligned}
& -2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 24, Calculating  $T_1T_2c_1z = zT_1T_2c_1$ , We got 40 equations .  
 Totally 45 solutions, dup count: 16.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45}
\end{aligned}$$



$$\begin{aligned}
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 25, Calculating  $T_1c_2c_3z = zT_1c_2c_3$ , We got 28 equations .  
Totally 45 solutions, dup count: 17.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3
\end{aligned}$$

$$+ a_{45}T_1T_2c_1c_2c_3$$

Round 26, Calculating  $T_1T_2c_2z = zT_1T_2c_2$ , We got 35 equations .  
Totally 45 solutions, dup count: 18.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0
\end{aligned}$$

$$\begin{aligned}
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 27, Calculating  $c_1c_2c_3z = zc_1c_2c_3$ , We got 22 equations .  
 Totally 45 solutions, dup count: 19.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 28, Calculating  $T_1T_2c_3z = zT_1T_2c_3$ , We got 35 equations .  
 Totally 45 solutions, dup count: 20.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40}
\end{aligned}$$

$$\begin{aligned}
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 29, Calculating  $T_1T_2T_1z = zT_1T_2T_1$ , We got 40 equations .

Totally 45 solutions, dup count: 21.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 30, Calculating  $T_2T_1c_1z = zT_2T_1c_1$ , We got 40 equations .  
 Totally 45 solutions, dup count: 22.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0
\end{aligned}$$



$$a_{34} = 0$$

$$a_{27} = 0$$

$$a_9 = 0$$

$$a_{20} = 0$$

$$a_{21} = 0$$

$$a_{42} = 0$$

$$a_{23} = 0$$

$$a_{16} = 0$$

$$a_{48} = 0$$

$$a_{46} = 0$$

$$a_{14} = 0$$

$$a_{15} = 0$$

$$a_{43} = 0$$

$$a_{25} = -qa_{43}$$

$$a_{24} = a_{45}$$

$$a_{35} = -a_{40}$$

$$a_{33} = a_{40}$$

$$a_{44} = -a_{45}$$

$$a_{47} = 0$$

$$a_7 = -a_{40}$$

$$a_{28} = a_{45}$$

$$a_{26} = a_{45}$$

$$a_{32} = 0$$

$$a_{36} = a_{40}$$

$$a_3 = 0$$

$$a_{41} = 0$$

$$a_{10} = 2a_{45} - 2qa_{45}$$

$$a_8 = -a_{40}$$

$$a_{18} = a_{45}$$

$$a_{30} = a_{45}$$

$$a_{37} = -a_{40}$$

$$a_4 = 0$$

$$a_5 = 0$$

$$a_{12} = 0$$

$$a_{22} = 0$$

$$a_{38} = -a_{40}$$

$$a_{31} = a_{45}$$

$$a_{29} = 0$$

$$a_{39} = 0$$

$$\begin{aligned}
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 31, Calculating  $T_2T_1c_2z = zT_2T_1c_2$ , We got 40 equations .  
 Totally 45 solutions, dup count: 23.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 32, Calculating  $T_1T_2T_1c_1z = zT_1T_2T_1c_1$ , We got 40 equations .  
Totally 45 solutions, dup count: 24.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0
\end{aligned}$$

$$\begin{aligned}
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

$$a_{17} = 2a_{45} - 2qa_{45}$$

Center:

$$\begin{aligned} z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\ & - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\ & - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\ & + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\ & - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\ & + a_{45}T_1T_2c_1c_2c_3 \end{aligned}$$

Round 33, Calculating  $T_1T_2c_1c_2z = zT_1T_2c_1c_2$ , We got 40 equations .

Totally 45 solutions, dup count: 25.

$$a_{19} = 0$$

$$a_{13} = 0$$

$$a_{34} = 0$$

$$a_{27} = 0$$

$$a_9 = 0$$

$$a_{20} = 0$$

$$a_{21} = 0$$

$$a_{42} = 0$$

$$a_{23} = 0$$

$$a_{16} = 0$$

$$a_{48} = 0$$

$$a_{46} = 0$$

$$a_{14} = 0$$

$$a_{15} = 0$$

$$a_{43} = 0$$

$$a_{25} = -qa_{43}$$

$$a_{24} = a_{45}$$

$$a_{35} = -a_{40}$$

$$a_{33} = a_{40}$$

$$a_{44} = -a_{45}$$

$$a_{47} = 0$$

$$a_7 = -a_{40}$$

$$a_{28} = a_{45}$$

$$a_{26} = a_{45}$$

$$a_{32} = 0$$

$$a_{36} = a_{40}$$

$$a_3 = 0$$

$$\begin{aligned}
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 34, Calculating  $T_1c_1c_2c_3z = zT_1c_1c_2c_3$ , We got 28 equations .  
 Totally 45 solutions, dup count: 26.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 35, Calculating  $T_2T_1c_1c_2z = zT_2T_1c_1c_2$ , We got 40 equations .  
 Totally 45 solutions, dup count: 27.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45}
\end{aligned}$$



$$\begin{aligned}
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 36, Calculating  $T_2T_1c_1c_3z = zT_2T_1c_1c_3$ , We got 40 equations .  
Totally 45 solutions, dup count: 28.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3
\end{aligned}$$

$$\begin{aligned}
& -2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
& + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 37, Calculating  $T_1T_2c_1c_3z = zT_1T_2c_1c_3$ , We got 40 equations .  
 Totally 45 solutions, dup count: 29.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45}
\end{aligned}$$

$$\begin{aligned}
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z &= a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
&\quad - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
&\quad - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
&\quad + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
&\quad - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
&\quad + a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Round 38, Calculating  $T_2T_1c_2c_3z = zT_2T_1c_2c_3$ , We got 40 equations .  
 Totally 45 solutions, dup count: 30.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0
\end{aligned}$$

$$\begin{aligned}
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0 \\
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = & a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
& - a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
& - 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
& + a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
& - a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3
\end{aligned}$$

$$+ a_{45}T_1T_2c_1c_2c_3$$

Solved, Totally 45 solutions.

$$\begin{aligned}
a_{19} &= 0 \\
a_{13} &= 0 \\
a_{34} &= 0 \\
a_{27} &= 0 \\
a_9 &= 0 \\
a_{20} &= 0 \\
a_{21} &= 0 \\
a_{42} &= 0 \\
a_{23} &= 0 \\
a_{16} &= 0 \\
a_{48} &= 0 \\
a_{46} &= 0 \\
a_{14} &= 0 \\
a_{15} &= 0 \\
a_{43} &= 0 \\
a_{25} &= -qa_{43} \\
a_{24} &= a_{45} \\
a_{35} &= -a_{40} \\
a_{33} &= a_{40} \\
a_{44} &= -a_{45} \\
a_{47} &= 0 \\
a_7 &= -a_{40} \\
a_{28} &= a_{45} \\
a_{26} &= a_{45} \\
a_{32} &= 0 \\
a_{36} &= a_{40} \\
a_3 &= 0 \\
a_{41} &= 0 \\
a_{10} &= 2a_{45} - 2qa_{45} \\
a_8 &= -a_{40} \\
a_{18} &= a_{45} \\
a_{30} &= a_{45} \\
a_{37} &= -a_{40} \\
a_4 &= 0 \\
a_5 &= 0
\end{aligned}$$

$$\begin{aligned}
a_{12} &= 0 \\
a_{22} &= 0 \\
a_{38} &= -a_{40} \\
a_{31} &= a_{45} \\
a_{29} &= 0 \\
a_{39} &= 0 \\
a_2 &= -2a_{40} + 2qa_{40} \\
a_6 &= 2a_{45} - 2qa_{45} - 2qa_{45} + 2q^2a_{45} \\
a_{11} &= 2a_{45} - 2qa_{45} \\
a_{17} &= 2a_{45} - 2qa_{45}
\end{aligned}$$

Center:

$$\begin{aligned}
z = a_1 - 2a_{40}T_1 + 2qa_{40}T_1 + 2a_{45}c_3 - 2qa_{45}c_3 - 2qa_{45}c_3 + 2q^2a_{45}c_3 - a_{40}T_1T_2 \\
- a_{40}T_2T_1 + 2a_{45}T_2c_2 - 2qa_{45}T_2c_2 + 2a_{45}T_2c_3 - 2qa_{45}T_2c_3 + 2a_{45}T_1c_3 \\
- 2qa_{45}T_1c_3 + a_{45}T_2T_1c_3 + a_{45}T_1T_2c_1 + a_{45}T_1T_2c_2 + a_{45}T_1T_2c_3 \\
+ a_{45}T_2T_1c_1 + a_{45}T_2T_1c_2 + a_{40}T_1T_2c_1c_2 - a_{40}T_2T_1c_1c_2 + a_{40}T_2T_1c_1c_3 \\
- a_{40}T_1T_2c_1c_3 - a_{40}T_2T_1c_2c_3 + a_{40}T_1T_2c_2c_3 - a_{45}T_2T_1c_1c_2c_3 \\
+ a_{45}T_1T_2c_1c_2c_3
\end{aligned}$$

Center:

$$\begin{aligned}
z = 1 \cdot a_1 \\
+ (-2T_1 - T_1T_2 + T_1T_2c_1c_2 - T_1T_2c_1c_3 + T_1T_2c_2c_3 - T_2T_1 - T_2T_1c_1c_2 \\
+ T_2T_1c_1c_3 - T_2T_1c_2c_3 + 2qT_1) \cdot a_{40} \\
+ (T_1T_2c_1 + T_1T_2c_1c_2c_3 + T_1T_2c_2 + T_1T_2c_3 + 2T_1c_3 + T_2T_1c_1 - T_2T_1c_1c_2c_3 \\
+ T_2T_1c_2 + T_2T_1c_3 + 2T_2c_2 + 2T_2c_3 + 2c_3 - 2qT_1c_3 - 2qT_2c_2 - 2qT_2c_3 - 4qc_3 \\
+ 2q^2c_3) \cdot a_{45}
\end{aligned}$$