

Rank-76100 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^3 + X_0^2 X_3 + X_1^2 X_2 + X_1 X_2^2 + X_0 X_3^2 + X_0 X_1 X_2 = 0$$

(1, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 1, 0, 1, 0, 0, 1, 0, 0, 0)

The point rank of the equation over GF(64) is 1090785350

General information

Number of lines	27
Number of points	4545
Number of singular points	0
Number of Eckardt points	13
Number of double points	96
Number of single points	1524
Number of points off lines	2912
Number of Hesse planes	0
Number of axes	16
Type of points on lines	65^{27}
Type of lines on points	$3^{13}, 2^{96}, 1^{1524}, 0^{2912}$

Singular Points

The surface has 0 singular points:

The 27 Lines

The lines and their Pluecker coordinates are:

$$\begin{aligned}\ell_0 = a_1 &= \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{21} \\ 0 & 1 & 0 & 0 \end{array} \right]_{15179328} = \left[\begin{array}{cccc} 1 & 0 & 0 & 57 \\ 0 & 1 & 0 & 0 \end{array} \right]_{15179328} = \mathbf{Pl}(56, 0, 0, 1, 0, 0)_{185} \\ \ell_1 = a_2 &= \left[\begin{array}{cccc} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right]_{17047616} = \left[\begin{array}{cccc} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right]_{17047616} = \mathbf{Pl}(0, 1, 0, 0, 0, 0)_1\end{aligned}$$

$$\begin{aligned}
\ell_2 = a_3 &= \begin{bmatrix} 1 & 0 & \epsilon^9 & \epsilon^{21} \\ 0 & 1 & 0 & \epsilon^{36} \end{bmatrix}_{15377199} = \begin{bmatrix} 1 & 0 & 47 & 57 \\ 0 & 1 & 0 & 36 \end{bmatrix}_{15377199} = \mathbf{Pl}(46, 36, 0, 62, 46, 1)_{12338097} \\
\ell_3 = a_4 &= \begin{bmatrix} 1 & 0 & \epsilon^{18} & \epsilon^{42} \\ 0 & 1 & 0 & \epsilon^9 \end{bmatrix}_{14961803} = \begin{bmatrix} 1 & 0 & 11 & 56 \\ 0 & 1 & 0 & 47 \end{bmatrix}_{14961803} = \mathbf{Pl}(10, 47, 0, 45, 10, 1)_{2902110} \\
\ell_4 = a_5 &= \begin{bmatrix} 1 & 0 & \epsilon^{36} & \epsilon^{21} \\ 0 & 1 & 0 & \epsilon^{18} \end{bmatrix}_{15329828} = \begin{bmatrix} 1 & 0 & 36 & 57 \\ 0 & 1 & 0 & 11 \end{bmatrix}_{15329828} = \mathbf{Pl}(37, 11, 0, 15, 37, 1)_{9976407} \\
\ell_5 = a_6 &= \begin{bmatrix} 1 & 0 & \epsilon^{54} & \epsilon^{21} \\ 0 & 1 & 1 & \epsilon^9 \end{bmatrix}_{15223947} = \begin{bmatrix} 1 & 0 & 10 & 57 \\ 0 & 1 & 1 & 47 \end{bmatrix}_{15223947} = \mathbf{Pl}(62, 25, 52, 54, 11, 1)_{3376111} \\
\ell_6 = b_1 &= \begin{bmatrix} 1 & \epsilon^{18} & 0 & \epsilon^{42} \\ 0 & 0 & 1 & \epsilon^9 \end{bmatrix}_{14962938} = \begin{bmatrix} 1 & 11 & 0 & 56 \\ 0 & 0 & 1 & 47 \end{bmatrix}_{14962938} = \mathbf{Pl}(0, 45, 10, 47, 10, 1)_{2904549} \\
\ell_7 = b_2 &= \begin{bmatrix} 1 & 0 & \epsilon^{54} & \epsilon^{42} \\ 0 & 1 & 1 & \epsilon^9 \end{bmatrix}_{14957643} = \begin{bmatrix} 1 & 0 & 10 & 56 \\ 0 & 1 & 1 & 47 \end{bmatrix}_{14957643} = \mathbf{Pl}(52, 54, 62, 25, 11, 1)_{3415098} \\
\ell_8 = b_3 &= \begin{bmatrix} 1 & \epsilon^{36} & 0 & \epsilon^{21} \\ 0 & 0 & 1 & \epsilon^{18} \end{bmatrix}_{15333231} = \begin{bmatrix} 1 & 36 & 0 & 57 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{15333231} = \mathbf{Pl}(0, 15, 37, 11, 37, 1)_{9984108} \\
\ell_9 = b_4 &= \begin{bmatrix} 1 & 0 & 0 & \epsilon^{21} \\ 0 & 0 & 1 & 0 \end{bmatrix}_{15183424} = \begin{bmatrix} 1 & 0 & 0 & 57 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{15183424} = \mathbf{Pl}(0, 57, 1, 0, 0, 0)_{122} \\
\ell_{10} = b_5 &= \begin{bmatrix} 1 & \epsilon^9 & 0 & \epsilon^{21} \\ 0 & 0 & 1 & \epsilon^{36} \end{bmatrix}_{15379027} = \begin{bmatrix} 1 & 47 & 0 & 57 \\ 0 & 0 & 1 & 36 \end{bmatrix}_{15379027} = \mathbf{Pl}(0, 62, 46, 36, 46, 1)_{12344018} \\
\ell_{11} = b_6 &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043520} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043520} = \mathbf{Pl}(0, 0, 0, 1, 0, 0)_{129} \\
\ell_{12} = c_{12} &= \begin{bmatrix} 1 & \epsilon^{18} & 0 & \epsilon^{21} \\ 0 & 0 & 1 & \epsilon^9 \end{bmatrix}_{15229242} = \begin{bmatrix} 1 & 11 & 0 & 57 \\ 0 & 0 & 1 & 47 \end{bmatrix}_{15229242} = \mathbf{Pl}(0, 8, 10, 47, 10, 1)_{2904512} \\
\ell_{13} = c_{13} &= \begin{bmatrix} 1 & 0 & \epsilon^{45} & \epsilon^{42} \\ 0 & 1 & 1 & \epsilon^{18} \end{bmatrix}_{15067686} = \begin{bmatrix} 1 & 0 & 37 & 56 \\ 0 & 1 & 1 & 11 \end{bmatrix}_{15067686} = \mathbf{Pl}(45, 7, 8, 12, 36, 1)_{9756167} \\
\ell_{14} = c_{14} &= \begin{bmatrix} 1 & 0 & 1 & \epsilon^{21} \\ 0 & 1 & 1 & 0 \end{bmatrix}_{15183490} = \begin{bmatrix} 1 & 0 & 1 & 57 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{15183490} = \mathbf{Pl}(56, 57, 1, 57, 0, 1)_{508849} \\
\ell_{15} = c_{15} &= \begin{bmatrix} 1 & 0 & \epsilon^{27} & \epsilon^{42} \\ 0 & 1 & 1 & \epsilon^{36} \end{bmatrix}_{15106735} = \begin{bmatrix} 1 & 0 & 46 & 56 \\ 0 & 1 & 1 & 36 \end{bmatrix}_{15106735} = \mathbf{Pl}(33, 49, 15, 21, 47, 1)_{12666377} \\
\ell_{16} = c_{16} &= \begin{bmatrix} 1 & 0 & 0 & \epsilon^{42} \\ 0 & 1 & 0 & 0 \end{bmatrix}_{14913024} = \begin{bmatrix} 1 & 0 & 0 & 56 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{14913024} = \mathbf{Pl}(57, 0, 0, 1, 0, 0)_{186} \\
\ell_{17} = c_{23} &= \begin{bmatrix} 1 & \epsilon^{36} & 0 & \epsilon^{42} \\ 0 & 0 & 1 & \epsilon^{18} \end{bmatrix}_{15066927} = \begin{bmatrix} 1 & 36 & 0 & 56 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{15066927} = \mathbf{Pl}(0, 33, 37, 11, 37, 1)_{9984126} \\
\ell_{18} = c_{24} &= \begin{bmatrix} 1 & 0 & 0 & \epsilon^{42} \\ 0 & 0 & 1 & 0 \end{bmatrix}_{14917120} = \begin{bmatrix} 1 & 0 & 0 & 56 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{14917120} = \mathbf{Pl}(0, 56, 1, 0, 0, 0)_{121} \\
\ell_{19} = c_{25} &= \begin{bmatrix} 1 & \epsilon^9 & 0 & \epsilon^{42} \\ 0 & 0 & 1 & \epsilon^{36} \end{bmatrix}_{15112723} = \begin{bmatrix} 1 & 47 & 0 & 56 \\ 0 & 0 & 1 & 36 \end{bmatrix}_{15112723} = \mathbf{Pl}(0, 52, 46, 36, 46, 1)_{12344008} \\
\ell_{20} = c_{26} &= \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043585} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043585} = \mathbf{Pl}(0, 1, 0, 1, 0, 0)_{193} \\
\ell_{21} = c_{34} &= \begin{bmatrix} 1 & 0 & \epsilon^{27} & \epsilon^{21} \\ 0 & 1 & 1 & \epsilon^{36} \end{bmatrix}_{15373039} = \begin{bmatrix} 1 & 0 & 46 & 57 \\ 0 & 1 & 1 & 36 \end{bmatrix}_{15373039} = \mathbf{Pl}(15, 21, 33, 49, 47, 1)_{12736730} \\
\ell_{22} = c_{35} &= \begin{bmatrix} 1 & 0 & 1 & \epsilon^{42} \\ 0 & 1 & 1 & 0 \end{bmatrix}_{14917186} = \begin{bmatrix} 1 & 0 & 1 & 56 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{14917186} = \mathbf{Pl}(57, 56, 1, 56, 0, 1)_{504881}
\end{aligned}$$

$$\begin{aligned}
\ell_{23} = c_{36} &= \begin{bmatrix} 1 & 0 & \epsilon^9 & \epsilon^{42} \\ 0 & 1 & 0 & \epsilon^{36} \end{bmatrix}_{15110895} = \begin{bmatrix} 1 & 0 & 47 & 56 \\ 0 & 1 & 0 & 36 \end{bmatrix}_{15110895} = \mathbf{Pl}(46, 36, 0, 52, 46, 1)_{12337467} \\
\ell_{24} = c_{45} &= \begin{bmatrix} 1 & 0 & \epsilon^{45} & \epsilon^{21} \\ 0 & 1 & 1 & \epsilon^{18} \end{bmatrix}_{15333990} = \begin{bmatrix} 1 & 0 & 37 & 57 \\ 0 & 1 & 1 & 11 \end{bmatrix}_{15333990} = \mathbf{Pl}(8, 12, 45, 7, 36, 1)_{9900715} \\
\ell_{25} = c_{46} &= \begin{bmatrix} 1 & 0 & \epsilon^{18} & \epsilon^{21} \\ 0 & 1 & 0 & \epsilon^9 \end{bmatrix}_{15228107} = \begin{bmatrix} 1 & 0 & 11 & 57 \\ 0 & 1 & 0 & 47 \end{bmatrix}_{15228107} = \mathbf{Pl}(10, 47, 0, 8, 10, 1)_{2899779} \\
\ell_{26} = c_{56} &= \begin{bmatrix} 1 & 0 & \epsilon^{36} & \epsilon^{42} \\ 0 & 1 & 0 & \epsilon^{18} \end{bmatrix}_{15063524} = \begin{bmatrix} 1 & 0 & 36 & 56 \\ 0 & 1 & 0 & 11 \end{bmatrix}_{15063524} = \mathbf{Pl}(37, 11, 0, 33, 37, 1)_{9977541}
\end{aligned}$$

Rank of lines: (15179328, 17047616, 15377199, 14961803, 15329828, 15223947, 14962938, 14957643, 15333231, 15183424, 15379027, 17043520, 15229242, 15067686, 15183490, 15106735, 14913024, 15066927, 14917120, 15112723, 17043585, 15373039, 14917186, 15110895, 15333990, 15228107, 15063524)

Rank of points on Klein quadric: (185, 1, 12338097, 2902110, 9976407, 3376111, 2904549, 3415098, 9984108, 122, 12344018, 129, 2904512, 9756167, 508849, 12666377, 186, 9984126, 121, 12344008, 193, 12736730, 504881, 12337467, 9900715, 2899779, 9977541)

Eckardt Points

The surface has 13 Eckardt points:

$$\begin{aligned}
0 : E_{16} &= a_1 \cap b_6 \cap c_{16} = P_1 = \mathbf{P}(0, 1, 0, 0) = \mathbf{P}(0, 1, 0, 0), \\
1 : E_{24} &= a_2 \cap b_4 \cap c_{24} = P_2 = \mathbf{P}(0, 0, 1, 0) = \mathbf{P}(0, 0, 1, 0), \\
2 : E_{26} &= a_2 \cap b_6 \cap c_{26} = P_3 = \mathbf{P}(0, 0, 0, 1) = \mathbf{P}(0, 0, 0, 1), \\
3 : E_{14,26,35} &= c_{14} \cap c_{26} \cap c_{35} = P_{131} = \mathbf{P}(0, 1, 1, 0) = \mathbf{P}(0, 1, 1, 0), \\
4 : E_{46} &= a_4 \cap b_6 \cap c_{46} = P_{4802} = \mathbf{P}(0, \epsilon^{54}, 0, 1) = \mathbf{P}(0, 10, 0, 1), \\
5 : E_{56} &= a_5 \cap b_6 \cap c_{56} = P_{6530} = \mathbf{P}(0, \epsilon^{45}, 0, 1) = \mathbf{P}(0, 37, 0, 1), \\
6 : E_{36} &= a_3 \cap b_6 \cap c_{36} = P_{7106} = \mathbf{P}(0, \epsilon^{27}, 0, 1) = \mathbf{P}(0, 46, 0, 1), \\
7 : E_{21} &= a_2 \cap b_1 \cap c_{12} = P_{45121} = \mathbf{P}(0, 0, \epsilon^{54}, 1) = \mathbf{P}(0, 0, 10, 1), \\
8 : E_{62} &= a_6 \cap b_2 \cap c_{26} = P_{45761} = \mathbf{P}(0, \epsilon^{54}, \epsilon^{54}, 1) = \mathbf{P}(0, 10, 10, 1), \\
9 : E_{23} &= a_2 \cap b_3 \cap c_{23} = P_{155713} = \mathbf{P}(0, 0, \epsilon^{45}, 1) = \mathbf{P}(0, 0, 37, 1), \\
10 : E_{13,26,45} &= c_{13} \cap c_{26} \cap c_{45} = P_{158081} = \mathbf{P}(0, \epsilon^{45}, \epsilon^{45}, 1) = \mathbf{P}(0, 37, 37, 1), \\
11 : E_{25} &= a_2 \cap b_5 \cap c_{25} = P_{192577} = \mathbf{P}(0, 0, \epsilon^{27}, 1) = \mathbf{P}(0, 0, 46, 1), \\
12 : E_{15,26,34} &= c_{15} \cap c_{26} \cap c_{34} = P_{195521} = \mathbf{P}(0, \epsilon^{27}, \epsilon^{27}, 1) = \mathbf{P}(0, 46, 46, 1).
\end{aligned}$$

Double Points

The surface has 96 Double points:

The double points on the surface are:

$$\begin{aligned}
P_{7546} &= (56, 52, 0, 1) = \ell_0 \cap \ell_7 = a_1 \cap b_2 & P_{184234} &= (41, 61, 43, 1) = \ell_2 \cap \ell_{13} = a_3 \cap c_{13} \\
P_{5562} &= (56, 21, 0, 1) = \ell_0 \cap \ell_8 = a_1 \cap b_3 & P_{28067} &= (34, 53, 5, 1) = \ell_2 \cap \ell_{17} = a_3 \cap c_{23} \\
P_{4218} &= (56, 0, 0, 1) = \ell_0 \cap \ell_9 = a_1 \cap b_4 & P_{32637} &= (60, 60, 6, 1) = \ell_2 \cap \ell_{21} = a_3 \cap c_{34} \\
P_{5818} &= (56, 25, 0, 1) = \ell_0 \cap \ell_{10} = a_1 \cap b_5 & P_{226362} &= (57, 15, 54, 1) = \ell_2 \cap \ell_{22} = a_3 \cap c_{35} \\
P_{4986} &= (56, 12, 0, 1) = \ell_0 \cap \ell_{12} = a_1 \cap c_{12} & P_{203875} &= (34, 48, 48, 1) = \ell_3 \cap \ell_6 = a_4 \cap b_1 \\
P_{7098} &= (56, 45, 0, 1) = \ell_0 \cap \ell_{13} = a_1 \cap c_{13} & P_{88746} &= (41, 41, 20, 1) = \ell_3 \cap \ell_7 = a_4 \cap b_2 \\
P_{7802} &= (56, 56, 0, 1) = \ell_0 \cap \ell_{14} = a_1 \cap c_{14} & P_{137725} &= (60, 38, 32, 1) = \ell_3 \cap \ell_8 = a_4 \cap b_3 \\
P_{6330} &= (56, 33, 0, 1) = \ell_0 \cap \ell_{15} = a_1 \cap c_{15} & P_{74428} &= (59, 9, 17, 1) = \ell_3 \cap \ell_{10} = a_4 \cap b_5 \\
P_{42172} &= (59, 17, 9, 1) = \ell_2 \cap \ell_6 = a_3 \cap b_1 & P_{56697} &= (56, 52, 12, 1) = \ell_3 \cap \ell_{14} = a_4 \cap c_{14} \\
P_{186976} &= (31, 40, 44, 1) = \ell_2 \cap \ell_7 = a_3 \cap b_2 & P_{32890} &= (57, 0, 7, 1) = \ell_3 \cap \ell_{18} = a_4 \cap c_{24} \\
P_{106617} &= (56, 0, 25, 1) = \ell_2 \cap \ell_9 = a_3 \cap b_4 & P_{117344} &= (31, 40, 27, 1) = \ell_3 \cap \ell_{21} = a_4 \cap c_{34} \\
P_{58260} &= (19, 13, 13, 1) = \ell_2 \cap \ell_{10} = a_3 \cap b_5 & P_{63444} &= (19, 30, 14, 1) = \ell_3 \cap \ell_{24} = a_4 \cap c_{45}
\end{aligned}$$

$P_{161917} = (60, 32, 38, 1) = \ell_4 \cap \ell_6 = a_5 \cap b_1$
 $P_{18388} = (19, 30, 3, 1) = \ell_4 \cap \ell_7 = a_5 \cap b_2$
 $P_{104060} = (59, 24, 24, 1) = \ell_4 \cap \ell_8 = a_5 \cap b_3$
 $P_{90233} = (56, 0, 21, 1) = \ell_4 \cap \ell_9 = a_5 \cap b_4$
 $P_{222435} = (34, 18, 53, 1) = \ell_4 \cap \ell_{15} = a_5 \cap c_{15}$
 $P_{265002} = (41, 43, 63, 1) = \ell_4 \cap \ell_{19} = a_5 \cap c_{25}$
 $P_{205434} = (57, 8, 49, 1) = \ell_4 \cap \ell_{22} = a_5 \cap c_{35}$
 $P_{231456} = (31, 31, 55, 1) = \ell_4 \cap \ell_{24} = a_5 \cap c_{45}$
 $P_{173418} = (41, 20, 41, 1) = \ell_5 \cap \ell_6 = a_6 \cap b_1$
 $P_{127252} = (19, 3, 30, 1) = \ell_5 \cap \ell_8 = a_6 \cap b_3$
 $P_{217209} = (56, 0, 52, 1) = \ell_5 \cap \ell_9 = a_6 \cap b_4$
 $P_{170848} = (31, 44, 40, 1) = \ell_5 \cap \ell_{10} = a_6 \cap b_5$
 $P_{8187} = (57, 62, 0, 1) = \ell_5 \cap \ell_{16} = a_6 \cap c_{16}$
 $P_{43324} = (59, 35, 9, 1) = \ell_5 \cap \ell_{23} = a_6 \cap c_{36}$
 $P_{202979} = (34, 34, 48, 1) = \ell_5 \cap \ell_{25} = a_6 \cap c_{46}$
 $P_{163581} = (60, 58, 38, 1) = \ell_5 \cap \ell_{26} = a_6 \cap c_{56}$
 $P_{127956} = (19, 14, 30, 1) = \ell_6 \cap \ell_{13} = b_1 \cap c_{13}$
 $P_{217977} = (56, 12, 52, 1) = \ell_6 \cap \ell_{14} = b_1 \cap c_{14}$
 $P_{169760} = (31, 27, 40, 1) = \ell_6 \cap \ell_{15} = b_1 \cap c_{15}$
 $P_{4667} = (57, 7, 0, 1) = \ell_6 \cap \ell_{16} = b_1 \cap c_{16}$
 $P_{146531} = (34, 48, 34, 1) = \ell_7 \cap \ell_{12} = b_2 \cap c_{12}$
 $P_{244221} = (60, 38, 58, 1) = \ell_7 \cap \ell_{17} = b_2 \cap c_{23}$
 $P_{258170} = (57, 0, 62, 1) = \ell_7 \cap \ell_{18} = b_2 \cap c_{24}$
 $P_{148156} = (59, 9, 35, 1) = \ell_7 \cap \ell_{19} = b_2 \cap c_{25}$
 $P_{134688} = (31, 55, 31, 1) = \ell_8 \cap \ell_{13} = b_3 \cap c_{13}$
 $P_{81315} = (34, 53, 18, 1) = \ell_8 \cap \ell_{21} = b_3 \cap c_{34}$
 $P_{40122} = (57, 49, 8, 1) = \ell_8 \cap \ell_{22} = b_3 \cap c_{35}$
 $P_{184362} = (41, 63, 43, 1) = \ell_8 \cap \ell_{23} = b_3 \cap c_{36}$
 $P_{233593} = (56, 0, 56, 1) = \ell_9 \cap \ell_{14} = b_4 \cap c_{14}$
 $P_{139385} = (56, 0, 33, 1) = \ell_9 \cap \ell_{21} = b_4 \cap c_{34}$
 $P_{188537} = (56, 0, 45, 1) = \ell_9 \cap \ell_{24} = b_4 \cap c_{45}$
 $P_{53369} = (56, 0, 12, 1) = \ell_9 \cap \ell_{25} = b_4 \cap c_{46}$
 $P_{250365} = (60, 6, 60, 1) = \ell_{10} \cap \ell_{15} = b_5 \cap c_{15}$
 $P_{69114} = (57, 54, 15, 1) = \ell_{10} \cap \ell_{22} = b_5 \cap c_{35}$
 $P_{256810} = (41, 43, 61, 1) = \ell_{10} \cap \ell_{24} = b_5 \cap c_{45}$
 $P_{221603} = (34, 5, 53, 1) = \ell_{10} \cap \ell_{26} = b_5 \cap c_{56}$
 $P_{148668} = (59, 17, 35, 1) = \ell_{12} \cap \ell_{21} = c_{12} \cap c_{34}$

$P_{258618} = (57, 7, 62, 1) = \ell_{12} \cap \ell_{22} = c_{12} \cap c_{35}$
 $P_{186144} = (31, 27, 44, 1) = \ell_{12} \cap \ell_{23} = c_{12} \cap c_{36}$
 $P_{243837} = (60, 32, 58, 1) = \ell_{12} \cap \ell_{24} = c_{12} \cap c_{45}$
 $P_{87402} = (41, 20, 20, 1) = \ell_{12} \cap \ell_{25} = c_{12} \cap c_{46}$
 $P_{17364} = (19, 14, 3, 1) = \ell_{12} \cap \ell_{26} = c_{12} \cap c_{56}$
 $P_{36986} = (57, 0, 8, 1) = \ell_{13} \cap \ell_{18} = c_{13} \cap c_{24}$
 $P_{78243} = (34, 5, 18, 1) = \ell_{13} \cap \ell_{19} = c_{13} \cap c_{25}$
 $P_{139005} = (60, 58, 32, 1) = \ell_{13} \cap \ell_{25} = c_{13} \cap c_{46}$
 $P_{106300} = (59, 59, 24, 1) = \ell_{13} \cap \ell_{26} = c_{13} \cap c_{56}$
 $P_{189881} = (56, 21, 45, 1) = \ell_{14} \cap \ell_{17} = c_{14} \cap c_{23}$
 $P_{140985} = (56, 25, 33, 1) = \ell_{14} \cap \ell_{19} = c_{14} \cap c_{25}$
 $P_{108729} = (56, 33, 25, 1) = \ell_{14} \cap \ell_{23} = c_{14} \cap c_{36}$
 $P_{93113} = (56, 45, 21, 1) = \ell_{14} \cap \ell_{26} = c_{14} \cap c_{56}$
 $P_{258090} = (41, 63, 61, 1) = \ell_{15} \cap \ell_{17} = c_{15} \cap c_{23}$
 $P_{65658} = (57, 0, 15, 1) = \ell_{15} \cap \ell_{18} = c_{15} \cap c_{24}$
 $P_{58644} = (19, 19, 13, 1) = \ell_{15} \cap \ell_{23} = c_{15} \cap c_{36}$
 $P_{76092} = (59, 35, 17, 1) = \ell_{15} \cap \ell_{25} = c_{15} \cap c_{46}$
 $P_{7355} = (57, 49, 0, 1) = \ell_{16} \cap \ell_{17} = c_{16} \cap c_{23}$
 $P_{4219} = (57, 0, 0, 1) = \ell_{16} \cap \ell_{18} = c_{16} \cap c_{24}$
 $P_{7675} = (57, 54, 0, 1) = \ell_{16} \cap \ell_{19} = c_{16} \cap c_{25}$
 $P_{5179} = (57, 15, 0, 1) = \ell_{16} \cap \ell_{21} = c_{16} \cap c_{34}$
 $P_{7867} = (57, 57, 0, 1) = \ell_{16} \cap \ell_{22} = c_{16} \cap c_{35}$
 $P_{4731} = (57, 8, 0, 1) = \ell_{16} \cap \ell_{24} = c_{16} \cap c_{45}$
 $P_{247420} = (59, 24, 59, 1) = \ell_{17} \cap \ell_{24} = c_{23} \cap c_{45}$
 $P_{61716} = (19, 3, 14, 1) = \ell_{17} \cap \ell_{25} = c_{23} \cap c_{46}$
 $P_{232992} = (31, 55, 55, 1) = \ell_{17} \cap \ell_{26} = c_{23} \cap c_{56}$
 $P_{237690} = (57, 0, 57, 1) = \ell_{18} \cap \ell_{22} = c_{24} \cap c_{35}$
 $P_{225402} = (57, 0, 54, 1) = \ell_{18} \cap \ell_{23} = c_{24} \cap c_{36}$
 $P_{204922} = (57, 0, 49, 1) = \ell_{18} \cap \ell_{26} = c_{24} \cap c_{56}$
 $P_{82836} = (19, 13, 19, 1) = \ell_{19} \cap \ell_{21} = c_{25} \cap c_{34}$
 $P_{29181} = (60, 6, 6, 1) = \ell_{19} \cap \ell_{23} = c_{25} \cap c_{36}$
 $P_{117600} = (31, 44, 27, 1) = \ell_{19} \cap \ell_{25} = c_{25} \cap c_{46}$
 $P_{266154} = (41, 61, 63, 1) = \ell_{21} \cap \ell_{26} = c_{34} \cap c_{56}$
 $P_{36858} = (57, 62, 7, 1) = \ell_{22} \cap \ell_{25} = c_{35} \cap c_{46}$
 $P_{25827} = (34, 18, 5, 1) = \ell_{23} \cap \ell_{24} = c_{36} \cap c_{45}$

Single Points

The surface has 1524 single points:

Too many to print.

Points on surface but on no line

The surface has 2912 points not on any line:

Too many to print.

Line Intersection Graph

		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
		a_1	a_2	a_3	a_4	a_5	a_6	b_1	b_2	b_3	b_4	b_5	b_6	c_{12}	c_{13}	c_{14}	c_{15}	c_{16}	c_{23}	c_{24}	c_{25}	c_{26}	c_{34}	c_{35}	c_{36}	c_{45}	c_{46}	c_{56}
0	a_1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
1	a_2	0	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0
2	a_3	0	0	0	0	0	0	1	1	0	1	1	1	0	1	0	0	0	1	0	0	0	1	1	1	0	0	0
3	a_4	0	0	0	0	0	0	1	1	1	0	1	1	0	0	1	0	0	0	1	0	0	1	0	0	1	1	0
4	a_5	0	0	0	0	0	0	1	1	1	1	0	1	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1
5	a_6	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1
6	b_1	0	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0
7	b_2	1	0	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	0
8	b_3	1	1	0	1	1	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1	1	1	0	0	0
9	b_4	1	1	1	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	1	0
10	b_5	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	1
11	b_6	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	1	1
12	c_{12}	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1
13	c_{13}	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1
14	c_{14}	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	1	1	0	0	1
15	c_{15}	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	1	1	0	1	0	1	0
16	c_{16}	1	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	1	1	1	0	1	1	0	1	0	0
17	c_{23}	0	1	1	0	0	0	0	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	1
18	c_{24}	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	1	1	0	0	0	0	0	1	1	0	0	1
19	c_{25}	0	1	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	0	0	0	0	1	0	1	0	1	0
20	c_{26}	0	1	0	0	0	1	0	1	0	0	0	1	0	1	1	1	0	0	0	0	0	1	1	0	1	0	0
21	c_{34}	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	1	0	0	1	1	0	0	0	0	0	1
22	c_{35}	0	0	1	0	1	0	0	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	1	0
23	c_{36}	0	0	1	0	0	1	0	0	1	0	0	1	1	0	1	1	0	0	1	1	0	0	0	0	1	0	0
24	c_{45}	0	0	0	1	1	0	0	0	0	1	1	0	1	1	0	0	1	1	0	0	1	0	0	1	0	0	0
25	c_{46}	0	0	0	1	0	1	0	0	0	1	0	1	1	1	0	1	0	1	0	1	0	0	1	0	0	0	0
26	c_{56}	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	0	0	1	1	0	0	1	0	0	0	0	0

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}
in point	P_{7546}	P_{5562}	P_{4218}	P_{5818}	P_1	P_{4986}	P_{7098}	P_{7802}	P_{6330}	P_1

Line 1 intersects

Line	ℓ_6	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}
in point	P_{45121}	P_{155713}	P_2	P_{192577}	P_3	P_{45121}	P_{155713}	P_2	P_{192577}	P_3

Line 2 intersects

Line	ℓ_6	ℓ_7	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{17}	ℓ_{21}	ℓ_{22}	ℓ_{23}
in point	P_{42172}	P_{186976}	P_{106617}	P_{58260}	P_{7106}	P_{184234}	P_{28067}	P_{32637}	P_{226362}	P_{7106}

Line 3 intersects

Line	ℓ_6	ℓ_7	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{14}	ℓ_{18}	ℓ_{21}	ℓ_{24}	ℓ_{25}
in point	P_{203875}	P_{88746}	P_{137725}	P_{74428}	P_{4802}	P_{56697}	P_{32890}	P_{117344}	P_{63444}	P_{4802}

Line 4 intersects

Line	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{15}	ℓ_{19}	ℓ_{22}	ℓ_{24}	ℓ_{26}
in point	P_{161917}	P_{18388}	P_{104060}	P_{90233}	P_{6530}	P_{222435}	P_{265002}	P_{205434}	P_{231456}	P_{6530}

Line 5 intersects

Line	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{16}	ℓ_{20}	ℓ_{23}	ℓ_{25}	ℓ_{26}
in point	P_{173418}	P_{45761}	P_{127252}	P_{217209}	P_{170848}	P_{8187}	P_{45761}	P_{43324}	P_{202979}	P_{163581}

Line 6 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}
in point	P_{45121}	P_{42172}	P_{203875}	P_{161917}	P_{173418}	P_{45121}	P_{127956}	P_{217977}	P_{169760}	P_{4667}

Line 7 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_{12}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}
in point	P_{7546}	P_{186976}	P_{88746}	P_{18388}	P_{45761}	P_{146531}	P_{244221}	P_{258170}	P_{148156}	P_{45761}

Line 8 intersects

Line	ℓ_0	ℓ_1	ℓ_3	ℓ_4	ℓ_5	ℓ_{13}	ℓ_{17}	ℓ_{21}	ℓ_{22}	ℓ_{23}
in point	P_{5562}	P_{155713}	P_{137725}	P_{104060}	P_{127252}	P_{134688}	P_{155713}	P_{81315}	P_{40122}	P_{184362}

Line 9 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_4	ℓ_5	ℓ_{14}	ℓ_{18}	ℓ_{21}	ℓ_{24}	ℓ_{25}
in point	P_{4218}	P_2	P_{106617}	P_{90233}	P_{217209}	P_{233593}	P_2	P_{139385}	P_{188537}	P_{53369}

Line 10 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_5	ℓ_{15}	ℓ_{19}	ℓ_{22}	ℓ_{24}	ℓ_{26}
in point	P_{5818}	P_{192577}	P_{58260}	P_{74428}	P_{170848}	P_{250365}	P_{192577}	P_{69114}	P_{256810}	P_{221603}

Line 11 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_{16}	ℓ_{20}	ℓ_{23}	ℓ_{25}	ℓ_{26}
in point	P_1	P_3	P_{7106}	P_{4802}	P_{6530}	P_1	P_3	P_{7106}	P_{4802}	P_{6530}

Line 12 intersects

Line	ℓ_0	ℓ_1	ℓ_6	ℓ_7	ℓ_{21}	ℓ_{22}	ℓ_{23}	ℓ_{24}	ℓ_{25}	ℓ_{26}
in point	P_{4986}	P_{45121}	P_{45121}	P_{146531}	P_{148668}	P_{258618}	P_{186144}	P_{243837}	P_{87402}	P_{17364}

Line 13 intersects

Line	ℓ_0	ℓ_2	ℓ_6	ℓ_8	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{24}	ℓ_{25}	ℓ_{26}
in point	P_{7098}	P_{184234}	P_{127956}	P_{134688}	P_{36986}	P_{78243}	P_{158081}	P_{158081}	P_{139005}	P_{106300}

Line 14 intersects

Line	ℓ_0	ℓ_3	ℓ_6	ℓ_9	ℓ_{17}	ℓ_{19}	ℓ_{20}	ℓ_{22}	ℓ_{23}	ℓ_{26}
in point	P_{7802}	P_{56697}	P_{217977}	P_{233593}	P_{189881}	P_{140985}	P_{131}	P_{131}	P_{108729}	P_{93113}

Line 15 intersects

Line	ℓ_0	ℓ_4	ℓ_6	ℓ_{10}	ℓ_{17}	ℓ_{18}	ℓ_{20}	ℓ_{21}	ℓ_{23}	ℓ_{25}
in point	P_{6330}	P_{222435}	P_{169760}	P_{250365}	P_{258090}	P_{65658}	P_{195521}	P_{195521}	P_{58644}	P_{76092}

Line 16 intersects

Line	ℓ_0	ℓ_5	ℓ_6	ℓ_{11}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{21}	ℓ_{22}	ℓ_{24}
in point	P_1	P_{8187}	P_{4667}	P_1	P_{7355}	P_{4219}	P_{7675}	P_{5179}	P_{7867}	P_{4731}

Line 17 intersects

Line	ℓ_1	ℓ_2	ℓ_7	ℓ_8	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{24}	ℓ_{25}	ℓ_{26}
in point	P_{155713}	P_{28067}	P_{244221}	P_{155713}	P_{189881}	P_{258090}	P_{7355}	P_{247420}	P_{61716}	P_{232992}

Line 18 intersects

Line	ℓ_1	ℓ_3	ℓ_7	ℓ_9	ℓ_{13}	ℓ_{15}	ℓ_{16}	ℓ_{22}	ℓ_{23}	ℓ_{26}
in point	P_2	P_{32890}	P_{258170}	P_2	P_{36986}	P_{65658}	P_{4219}	P_{237690}	P_{225402}	P_{204922}

Line 19 intersects

Line	ℓ_1	ℓ_4	ℓ_7	ℓ_{10}	ℓ_{13}	ℓ_{14}	ℓ_{16}	ℓ_{21}	ℓ_{23}	ℓ_{25}
in point	P_{192577}	P_{265002}	P_{148156}	P_{192577}	P_{78243}	P_{140985}	P_{7675}	P_{82836}	P_{29181}	P_{117600}

Line 20 intersects

Line	ℓ_1	ℓ_5	ℓ_7	ℓ_{11}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{21}	ℓ_{22}	ℓ_{24}
in point	P_3	P_{45761}	P_{45761}	P_3	P_{158081}	P_{131}	P_{195521}	P_{195521}	P_{131}	P_{158081}

Line 21 intersects

Line	ℓ_2	ℓ_3	ℓ_8	ℓ_9	ℓ_{12}	ℓ_{15}	ℓ_{16}	ℓ_{19}	ℓ_{20}	ℓ_{26}
in point	P_{32637}	P_{117344}	P_{81315}	P_{139385}	P_{148668}	P_{195521}	P_{5179}	P_{82836}	P_{195521}	P_{266154}

Line 22 intersects

Line	ℓ_2	ℓ_4	ℓ_8	ℓ_{10}	ℓ_{12}	ℓ_{14}	ℓ_{16}	ℓ_{18}	ℓ_{20}	ℓ_{25}
in point	P_{226362}	P_{205434}	P_{40122}	P_{69114}	P_{258618}	P_{131}	P_{7867}	P_{237690}	P_{131}	P_{36858}

Line 23 intersects

Line	ℓ_2	ℓ_5	ℓ_8	ℓ_{11}	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{18}	ℓ_{19}	ℓ_{24}
in point	P_{7106}	P_{43324}	P_{184362}	P_{7106}	P_{186144}	P_{108729}	P_{58644}	P_{225402}	P_{29181}	P_{25827}

Line 24 intersects

Line	ℓ_3	ℓ_4	ℓ_9	ℓ_{10}	ℓ_{12}	ℓ_{13}	ℓ_{16}	ℓ_{17}	ℓ_{20}	ℓ_{23}
in point	P_{63444}	P_{231456}	P_{188537}	P_{256810}	P_{243837}	P_{158081}	P_{4731}	P_{247420}	P_{158081}	P_{25827}

Line 25 intersects

Line	ℓ_3	ℓ_5	ℓ_9	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{15}	ℓ_{17}	ℓ_{19}	ℓ_{22}
in point	P_{4802}	P_{202979}	P_{53369}	P_{4802}	P_{87402}	P_{139005}	P_{76092}	P_{61716}	P_{117600}	P_{36858}

Line 26 intersects

Line	ℓ_4	ℓ_5	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{17}	ℓ_{18}	ℓ_{21}
in point	P_{6530}	P_{163581}	P_{221603}	P_{6530}	P_{17364}	P_{106300}	P_{93113}	P_{232992}	P_{204922}	P_{266154}

The surface has 4545 points:

Too many to print.