

Rank-65744 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

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

The point rank of the equation over GF(64) is 1091051590

General information

Number of lines	27
Number of points	4545
Number of singular points	0
Number of Eckardt points	1
Number of double points	132
Number of single points	1488
Number of points off lines	2924
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^{27}
Type of lines on points	$3, 2^{132}, 1^{1488}, 0^{2924}$

Singular Points

The surface has 0 singular points:

The 27 Lines

The lines and their Pluecker coordinates are:

$$\begin{aligned} \ell_0 = a_1 &= \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{21} \end{array} \right]_{17043513} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 57 \end{array} \right]_{17043513} = \mathbf{Pl}(0, 0, 0, 57, 0, 1)_{285641} \\ \ell_1 = a_2 &= \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array} \right]_{8258} = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array} \right]_{8258} = \mathbf{Pl}(0, 0, 1, 1, 1, 1)_{544578} \end{aligned}$$

$$\begin{aligned}
\ell_2 = a_3 &= \begin{bmatrix} 1 & 0 & \epsilon^{53} & \epsilon^5 \\ 0 & 1 & \epsilon^{44} & \epsilon^{44} \end{bmatrix}_{8544743} = \begin{bmatrix} 1 & 0 & 5 & 32 \\ 0 & 1 & 34 & 34 \end{bmatrix}_{8544743} = \mathbf{Pl}(46, 36, 15, 21, 10, 1)_{2967225} \\
\ell_3 = a_4 &= \begin{bmatrix} 1 & 0 & \epsilon^{29} & \epsilon^{17} \\ 0 & 1 & \epsilon^{11} & \epsilon^{11} \end{bmatrix}_{14228474} = \begin{bmatrix} 1 & 0 & 27 & 53 \\ 0 & 1 & 31 & 31 \end{bmatrix}_{14228474} = \mathbf{Pl}(10, 47, 62, 25, 37, 1)_{10227183} \\
\ell_4 = a_5 &= \begin{bmatrix} 1 & 0 & \epsilon^{58} & \epsilon^{34} \\ 0 & 1 & \epsilon^{22} & \epsilon^{22} \end{bmatrix}_{2410454} = \begin{bmatrix} 1 & 0 & 3 & 9 \\ 0 & 1 & 19 & 19 \end{bmatrix}_{2410454} = \mathbf{Pl}(37, 11, 45, 7, 46, 1)_{12518394} \\
\ell_5 = a_6 &= \begin{bmatrix} 1 & 0 & \epsilon^{24} & \epsilon^{32} \\ 0 & 1 & \epsilon & \epsilon^{43} \end{bmatrix}_{7112239} = \begin{bmatrix} 1 & 0 & 45 & 26 \\ 0 & 1 & 2 & 17 \end{bmatrix}_{7112239} = \mathbf{Pl}(25, 62, 20, 39, 22, 1)_{6132072} \\
\ell_6 = b_1 &= \begin{bmatrix} 1 & 0 & \epsilon^{29} & \epsilon^{17} \\ 0 & 1 & \epsilon^6 & \epsilon^{48} \end{bmatrix}_{14227452} = \begin{bmatrix} 1 & 0 & 27 & 53 \\ 0 & 1 & 33 & 15 \end{bmatrix}_{14227452} = \mathbf{Pl}(25, 62, 62, 25, 22, 1)_{6297384} \\
\ell_7 = b_2 &= \begin{bmatrix} 1 & 0 & \epsilon^3 & \epsilon^4 \\ 0 & 1 & \epsilon^8 & \epsilon^{29} \end{bmatrix}_{4295919} = \begin{bmatrix} 1 & 0 & 8 & 16 \\ 0 & 1 & 39 & 27 \end{bmatrix}_{4295919} = \mathbf{Pl}(54, 52, 48, 2, 23, 1)_{6502919} \\
\ell_8 = b_3 &= \begin{bmatrix} 1 & 0 & \epsilon^{46} & \epsilon^{40} \\ 0 & 1 & \epsilon^3 & \epsilon^{24} \end{bmatrix}_{3910067} = \begin{bmatrix} 1 & 0 & 43 & 14 \\ 0 & 1 & 8 & 45 \end{bmatrix}_{3910067} = \mathbf{Pl}(49, 33, 33, 49, 28, 1)_{7755921} \\
\ell_9 = b_4 &= \begin{bmatrix} 1 & 0 & \epsilon^{58} & \epsilon^{34} \\ 0 & 1 & \epsilon^{12} & \epsilon^{33} \end{bmatrix}_{2412609} = \begin{bmatrix} 1 & 0 & 3 & 9 \\ 0 & 1 & 62 & 52 \end{bmatrix}_{2412609} = \mathbf{Pl}(7, 45, 45, 7, 51, 1)_{13829016} \\
\ell_{10} = b_5 &= \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & \epsilon^{21} & \epsilon^{42} \end{bmatrix}_{7802} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 57 & 56 \end{bmatrix}_{7802} = \mathbf{Pl}(57, 56, 56, 0, 56, 1)_{14954561} \\
\ell_{11} = b_6 &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{17043457} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{17043457} = \mathbf{Pl}(0, 0, 0, 1, 0, 1)_{278529} \\
\ell_{12} = c_{12} &= \begin{bmatrix} 1 & 0 & \epsilon^{43} & \epsilon^{10} \\ 0 & 1 & \epsilon^{48} & \epsilon^6 \end{bmatrix}_{16850016} = \begin{bmatrix} 1 & 0 & 17 & 63 \\ 0 & 1 & 15 & 33 \end{bmatrix}_{16850016} = \mathbf{Pl}(54, 52, 52, 54, 23, 1)_{6520433} \\
\ell_{13} = c_{13} &= \begin{bmatrix} 1 & 0 & \epsilon^{12} & \epsilon^{16} \\ 0 & 1 & \epsilon^{32} & \epsilon^{53} \end{bmatrix}_{11443096} = \begin{bmatrix} 1 & 0 & 62 & 42 \\ 0 & 1 & 26 & 5 \end{bmatrix}_{11443096} = \mathbf{Pl}(49, 33, 6, 16, 28, 1)_{7650900} \\
\ell_{14} = c_{14} &= \begin{bmatrix} 1 & 0 & \epsilon^{48} & \epsilon \\ 0 & 1 & \epsilon^2 & \epsilon^{23} \end{bmatrix}_{597459} = \begin{bmatrix} 1 & 0 & 15 & 2 \\ 0 & 1 & 4 & 38 \end{bmatrix}_{597459} = \mathbf{Pl}(7, 45, 55, 42, 51, 1)_{13867572} \\
\ell_{15} = c_{15} &= \begin{bmatrix} 1 & 0 & \epsilon^{21} & 1 \\ 0 & 1 & \epsilon^{42} & 1 \end{bmatrix}_{503601} = \begin{bmatrix} 1 & 0 & 57 & 1 \\ 0 & 1 & 56 & 1 \end{bmatrix}_{503601} = \mathbf{Pl}(57, 56, 57, 56, 56, 1)_{15189236} \\
\ell_{16} = c_{16} &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{42} \end{bmatrix}_{17043512} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 56 \end{bmatrix}_{17043512} = \mathbf{Pl}(0, 0, 0, 56, 0, 1)_{285514} \\
\ell_{17} = c_{23} &= \begin{bmatrix} 1 & 0 & \epsilon^{53} & \epsilon^5 \\ 0 & 1 & \epsilon^{24} & \epsilon^3 \end{bmatrix}_{8543090} = \begin{bmatrix} 1 & 0 & 5 & 32 \\ 0 & 1 & 45 & 8 \end{bmatrix}_{8543090} = \mathbf{Pl}(21, 15, 15, 21, 29, 1)_{7947665} \\
\ell_{18} = c_{24} &= \begin{bmatrix} 1 & 0 & \epsilon^{23} & \epsilon^{20} \\ 0 & 1 & \epsilon^{33} & \epsilon^{12} \end{bmatrix}_{11879514} = \begin{bmatrix} 1 & 0 & 38 & 44 \\ 0 & 1 & 52 & 62 \end{bmatrix}_{11879514} = \mathbf{Pl}(12, 8, 8, 12, 50, 1)_{13422419} \\
\ell_{19} = c_{25} &= \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & \epsilon^{42} & \epsilon^{21} \end{bmatrix}_{7865} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 56 & 57 \end{bmatrix}_{7865} = \mathbf{Pl}(56, 57, 57, 0, 57, 1)_{15216703} \\
\ell_{20} = c_{26} &= \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{270530} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{270530} = \mathbf{Pl}(1, 0, 1, 1, 1, 1)_{544579} \\
\ell_{21} = c_{34} &= \begin{bmatrix} 1 & 0 & \epsilon^{42} & 1 \\ 0 & 1 & \epsilon^{21} & 1 \end{bmatrix}_{499441} = \begin{bmatrix} 1 & 0 & 56 & 1 \\ 0 & 1 & 57 & 1 \end{bmatrix}_{499441} = \mathbf{Pl}(56, 57, 56, 57, 57, 1)_{15447346} \\
\ell_{22} = c_{35} &= \begin{bmatrix} 1 & 0 & \epsilon^6 & \epsilon^8 \\ 0 & 1 & \epsilon^{16} & \epsilon^{58} \end{bmatrix}_{10523403} = \begin{bmatrix} 1 & 0 & 33 & 39 \\ 0 & 1 & 42 & 3 \end{bmatrix}_{10523403} = \mathbf{Pl}(12, 8, 24, 4, 50, 1)_{13486616}
\end{aligned}$$

$$\begin{aligned}
\ell_{23} = c_{36} &= \begin{bmatrix} 1 & 0 & \epsilon^{46} & \epsilon^{40} \\ 0 & 1 & \epsilon^{37} & \epsilon^{37} \end{bmatrix}_{3909844} = \begin{bmatrix} 1 & 0 & 43 & 14 \\ 0 & 1 & 41 & 41 \end{bmatrix}_{3909844} = \mathbf{PI}(46, 36, 33, 49, 10, 1)_{3039297} \\
\ell_{24} = c_{45} &= \begin{bmatrix} 1 & 0 & \epsilon^{33} & \epsilon^2 \\ 0 & 1 & \epsilon^4 & \epsilon^{46} \end{bmatrix}_{1284356} = \begin{bmatrix} 1 & 0 & 52 & 4 \\ 0 & 1 & 16 & 43 \end{bmatrix}_{1284356} = \mathbf{PI}(21, 15, 13, 26, 29, 1)_{7937900} \\
\ell_{25} = c_{46} &= \begin{bmatrix} 1 & 0 & \epsilon^{43} & \epsilon^{10} \\ 0 & 1 & \epsilon^{25} & \epsilon^{25} \end{bmatrix}_{16851724} = \begin{bmatrix} 1 & 0 & 17 & 63 \\ 0 & 1 & 59 & 59 \end{bmatrix}_{16851724} = \mathbf{PI}(10, 47, 52, 54, 37, 1)_{10189950} \\
\ell_{26} = c_{56} &= \begin{bmatrix} 1 & 0 & \epsilon^{23} & \epsilon^{20} \\ 0 & 1 & \epsilon^{50} & \epsilon^{50} \end{bmatrix}_{11879394} = \begin{bmatrix} 1 & 0 & 38 & 44 \\ 0 & 1 & 60 & 60 \end{bmatrix}_{11879394} = \mathbf{PI}(37, 11, 8, 12, 46, 1)_{12374187}
\end{aligned}$$

Rank of lines: (17043513, 8258, 8544743, 14228474, 2410454, 7112239, 14227452, 4295919, 3910067, 2412609, 7802, 17043457, 16850016, 11443096, 597459, 503601, 17043512, 8543090, 11879514, 7865, 270530, 499441, 10523403, 3909844, 1284356, 16851724, 11879394)

Rank of points on Klein quadric: (285641, 544578, 2967225, 10227183, 12518394, 6132072, 6297384, 6502919, 7755921, 13829016, 14954561, 278529, 6520433, 7650900, 13867572, 15189236, 285514, 7947665, 13422419, 15216703, 544579, 15447346, 13486616, 3039297, 7937900, 10189950, 12374187)

Eckardt Points

The surface has 1 Eckardt points:

$$0 : E_{16} = a_1 \cap b_6 \cap c_{16} = P_1 = \mathbf{P}(0, 1, 0, 0) = \mathbf{P}(0, 1, 0, 0).$$

Double Points

The surface has 132 Double points:

The double points on the surface are:

$$\begin{aligned}
P_{234113} &= (0, 9, 56, 1) = \ell_0 \cap \ell_7 = a_1 \cap b_2 \\
P_{233985} &= (0, 7, 56, 1) = \ell_0 \cap \ell_8 = a_1 \cap b_3 \\
P_{236993} &= (0, 54, 56, 1) = \ell_0 \cap \ell_9 = a_1 \cap b_4 \\
P_{237185} &= (0, 57, 56, 1) = \ell_0 \cap \ell_{10} = a_1 \cap b_5 \\
P_{236673} &= (0, 49, 56, 1) = \ell_0 \cap \ell_{12} = a_1 \cap c_{12} \\
P_{237569} &= (0, 63, 56, 1) = \ell_0 \cap \ell_{13} = a_1 \cap c_{13} \\
P_{234433} &= (0, 14, 56, 1) = \ell_0 \cap \ell_{14} = a_1 \cap c_{14} \\
P_{233601} &= (0, 1, 56, 1) = \ell_0 \cap \ell_{15} = a_1 \cap c_{15} \\
P_{10207} &= (30, 30, 1, 1) = \ell_1 \cap \ell_6 = a_2 \cap b_1 \\
P_{10857} &= (40, 40, 1, 1) = \ell_1 \cap \ell_8 = a_2 \cap b_3 \\
P_{9427} &= (18, 18, 1, 1) = \ell_1 \cap \ell_9 = a_2 \cap b_4 \\
P_{11962} &= (57, 57, 1, 1) = \ell_1 \cap \ell_{10} = a_2 \cap b_5 \\
P_{8258} &= (0, 0, 1, 1) = \ell_1 \cap \ell_{11} = a_2 \cap b_6 \\
P_{12027} &= (58, 58, 1, 1) = \ell_1 \cap \ell_{12} = a_2 \cap c_{12} \\
P_{10532} &= (35, 35, 1, 1) = \ell_1 \cap \ell_{17} = a_2 \cap c_{23} \\
P_{12222} &= (61, 61, 1, 1) = \ell_1 \cap \ell_{18} = a_2 \cap c_{24} \\
P_{11897} &= (56, 56, 1, 1) = \ell_1 \cap \ell_{19} = a_2 \cap c_{25} \\
P_5 &= (1, 1, 0, 0) = \ell_1 \cap \ell_{20} = a_2 \cap c_{26} \\
P_{172384} &= (31, 4, 41, 1) = \ell_2 \cap \ell_6 = a_3 \cap b_1 \\
P_{143996} &= (59, 8, 34, 1) = \ell_2 \cap \ell_7 = a_3 \cap b_2 \\
P_{126663} &= (6, 58, 29, 1) = \ell_2 \cap \ell_9 = a_3 \cap b_4 \\
P_{233104} &= (15, 57, 55, 1) = \ell_2 \cap \ell_{10} = a_3 \cap b_5 \\
P_{9665} &= (0, 22, 1, 1) = \ell_2 \cap \ell_{11} = a_3 \cap b_6 \\
P_{141479} &= (38, 33, 33, 1) = \ell_2 \cap \ell_{13} = a_3 \cap c_{13} \\
P_{65604} &= (3, 0, 15, 1) = \ell_2 \cap \ell_{17} = a_3 \cap c_{23} \\
P_{104546} &= (33, 32, 24, 1) = \ell_2 \cap \ell_{21} = a_3 \cap c_{34} \\
P_{118990} &= (13, 2, 28, 1) = \ell_2 \cap \ell_{22} = a_3 \cap c_{35} \\
P_{7117} &= (11, 46, 0, 1) = \ell_2 \cap \ell_{23} = a_3 \cap c_{36} \\
P_{258156} &= (43, 0, 62, 1) = \ell_3 \cap \ell_6 = a_4 \cap b_1 \\
P_{220486} &= (5, 52, 52, 1) = \ell_3 \cap \ell_7 = a_4 \cap b_2 \\
P_{95473} &= (48, 18, 22, 1) = \ell_3 \cap \ell_8 = a_4 \cap b_3 \\
P_{32447} &= (62, 57, 6, 1) = \ell_3 \cap \ell_{10} = a_4 \cap b_5 \\
P_{11457} &= (0, 50, 1, 1) = \ell_3 \cap \ell_{11} = a_4 \cap b_6 \\
P_{132116} &= (19, 15, 31, 1) = \ell_3 \cap \ell_{14} = a_4 \cap c_{14} \\
P_{247549} &= (60, 26, 59, 1) = \ell_3 \cap \ell_{18} = a_4 \cap c_{24} \\
P_{60853} &= (52, 53, 13, 1) = \ell_3 \cap \ell_{21} = a_4 \cap c_{34} \\
P_{101077} &= (20, 42, 23, 1) = \ell_3 \cap \ell_{24} = a_4 \cap c_{45} \\
P_{4838} &= (36, 10, 0, 1) = \ell_3 \cap \ell_{25} = a_4 \cap c_{46} \\
P_{215321} &= (24, 35, 51, 1) = \ell_4 \cap \ell_6 = a_5 \cap b_1 \\
P_{210680} &= (55, 26, 50, 1) = \ell_4 \cap \ell_7 = a_5 \cap b_2 \\
P_{250090} &= (41, 2, 60, 1) = \ell_4 \cap \ell_8 = a_5 \cap b_3 \\
P_{188508} &= (27, 0, 45, 1) = \ell_4 \cap \ell_9 = a_5 \cap b_4 \\
P_{10049} &= (0, 28, 1, 1) = \ell_4 \cap \ell_{11} = a_5 \cap b_6 \\
P_{201353} &= (8, 9, 48, 1) = \ell_4 \cap \ell_{15} = a_5 \cap c_{15} \\
P_{89710} &= (45, 56, 20, 1) = \ell_4 \cap \ell_{19} = a_5 \cap c_{25} \\
P_{37458} &= (17, 8, 8, 1) = \ell_4 \cap \ell_{22} = a_5 \cap c_{35} \\
P_{85347} &= (34, 52, 19, 1) = \ell_4 \cap \ell_{24} = a_5 \cap c_{45} \\
P_{6577} &= (47, 37, 0, 1) = \ell_4 \cap \ell_{26} = a_5 \cap c_{56}
\end{aligned}$$

$P_{5823} = (61, 25, 0, 1) = \ell_5 \cap \ell_6 = a_6 \cap b_1$
 $P_{47526} = (37, 37, 10, 1) = \ell_5 \cap \ell_7 = a_6 \cap b_2$
 $P_{156048} = (15, 5, 37, 1) = \ell_5 \cap \ell_8 = a_6 \cap b_3$
 $P_{196661} = (52, 63, 46, 1) = \ell_5 \cap \ell_9 = a_6 \cap b_4$
 $P_{200344} = (23, 57, 47, 1) = \ell_5 \cap \ell_{10} = a_6 \cap b_5$
 $P_{240449} = (0, 44, 57, 1) = \ell_5 \cap \ell_{16} = a_6 \cap c_{16}$
 $P_{10271} = (30, 31, 1, 1) = \ell_5 \cap \ell_{20} = a_6 \cap c_{26}$
 $P_{175008} = (31, 45, 41, 1) = \ell_5 \cap \ell_{23} = a_6 \cap c_{36}$
 $P_{262124} = (43, 62, 62, 1) = \ell_5 \cap \ell_{25} = a_6 \cap c_{46}$
 $P_{214105} = (24, 16, 51, 1) = \ell_5 \cap \ell_{26} = a_6 \cap c_{56}$
 $P_{48166} = (37, 47, 10, 1) = \ell_6 \cap \ell_{12} = b_1 \cap c_{12}$
 $P_{157776} = (15, 32, 37, 1) = \ell_6 \cap \ell_{13} = b_1 \cap c_{13}$
 $P_{193717} = (52, 17, 46, 1) = \ell_6 \cap \ell_{14} = b_1 \cap c_{14}$
 $P_{198104} = (23, 22, 47, 1) = \ell_6 \cap \ell_{15} = b_1 \cap c_{15}$
 $P_{238977} = (0, 21, 57, 1) = \ell_6 \cap \ell_{16} = b_1 \cap c_{16}$
 $P_{7636} = (18, 54, 0, 1) = \ell_7 \cap \ell_{12} = b_2 \cap c_{12}$
 $P_{158498} = (33, 43, 37, 1) = \ell_7 \cap \ell_{17} = b_2 \cap c_{23}$
 $P_{196031} = (62, 53, 46, 1) = \ell_7 \cap \ell_{18} = b_2 \cap c_{24}$
 $P_{200279} = (22, 56, 47, 1) = \ell_7 \cap \ell_{19} = b_2 \cap c_{25}$
 $P_{12091} = (58, 59, 1, 1) = \ell_7 \cap \ell_{20} = b_2 \cap c_{26}$
 $P_{7356} = (58, 49, 0, 1) = \ell_8 \cap \ell_{13} = b_3 \cap c_{13}$
 $P_{194891} = (10, 36, 46, 1) = \ell_8 \cap \ell_{17} = b_3 \cap c_{23}$
 $P_{153438} = (29, 28, 36, 1) = \ell_8 \cap \ell_{21} = b_3 \cap c_{34}$
 $P_{45742} = (45, 9, 10, 1) = \ell_8 \cap \ell_{22} = b_3 \cap c_{35}$
 $P_{139367} = (38, 0, 33, 1) = \ell_8 \cap \ell_{23} = b_3 \cap c_{36}$
 $P_{4650} = (40, 7, 0, 1) = \ell_9 \cap \ell_{14} = b_4 \cap c_{14}$
 $P_{156463} = (46, 11, 37, 1) = \ell_9 \cap \ell_{18} = b_4 \cap c_{24}$
 $P_{52531} = (50, 51, 11, 1) = \ell_9 \cap \ell_{21} = b_4 \cap c_{34}$
 $P_{47561} = (8, 38, 10, 1) = \ell_9 \cap \ell_{24} = b_4 \cap c_{45}$
 $P_{132180} = (19, 16, 31, 1) = \ell_9 \cap \ell_{25} = b_4 \cap c_{46}$
 $P_{7866} = (56, 57, 0, 1) = \ell_{10} \cap \ell_{15} = b_5 \cap c_{15}$
 $P_{68} = (1, 0, 1, 0) = \ell_{10} \cap \ell_{19} = b_5 \cap c_{25}$
 $P_{52916} = (51, 57, 11, 1) = \ell_{10} \cap \ell_{22} = b_5 \cap c_{35}$
 $P_{155293} = (28, 57, 36, 1) = \ell_{10} \cap \ell_{24} = b_5 \cap c_{45}$
 $P_{204425} = (8, 57, 48, 1) = \ell_{10} \cap \ell_{26} = b_5 \cap c_{56}$
 $P_{8322} = (0, 1, 1, 1) = \ell_{11} \cap \ell_{20} = b_6 \cap c_{26}$
 $P_{9729} = (0, 23, 1, 1) = \ell_{11} \cap \ell_{23} = b_6 \cap c_{36}$
 $P_{11521} = (0, 51, 1, 1) = \ell_{11} \cap \ell_{25} = b_6 \cap c_{46}$
 $P_{10113} = (0, 29, 1, 1) = \ell_{11} \cap \ell_{26} = b_6 \cap c_{56}$
 $P_{198167} = (22, 23, 47, 1) = \ell_{12} \cap \ell_{21} = c_{12} \cap c_{34}$
 $P_{194367} = (62, 27, 46, 1) = \ell_{12} \cap \ell_{22} = c_{12} \cap c_{35}$
 $P_{146172} = (59, 42, 34, 1) = \ell_{12} \cap \ell_{23} = c_{12} \cap c_{36}$
 $P_{156642} = (33, 14, 37, 1) = \ell_{12} \cap \ell_{24} = c_{12} \cap c_{45}$

$P_{217158} = (5, 0, 52, 1) = \ell_{12} \cap \ell_{25} = c_{12} \cap c_{46}$
 $P_{211576} = (55, 40, 50, 1) = \ell_{12} \cap \ell_{26} = c_{12} \cap c_{56}$
 $P_{45358} = (45, 3, 10, 1) = \ell_{13} \cap \ell_{18} = c_{13} \cap c_{24}$
 $P_{155230} = (29, 56, 36, 1) = \ell_{13} \cap \ell_{19} = c_{13} \cap c_{25}$
 $P_{10921} = (40, 41, 1, 1) = \ell_{13} \cap \ell_{20} = c_{13} \cap c_{26}$
 $P_{193227} = (10, 10, 46, 1) = \ell_{13} \cap \ell_{24} = c_{13} \cap c_{45}$
 $P_{94577} = (48, 4, 22, 1) = \ell_{13} \cap \ell_{25} = c_{13} \cap c_{46}$
 $P_{253930} = (41, 62, 60, 1) = \ell_{13} \cap \ell_{26} = c_{13} \cap c_{56}$
 $P_{47945} = (8, 44, 10, 1) = \ell_{14} \cap \ell_{17} = c_{14} \cap c_{23}$
 $P_{52851} = (50, 56, 11, 1) = \ell_{14} \cap \ell_{19} = c_{14} \cap c_{25}$
 $P_{9491} = (18, 19, 1, 1) = \ell_{14} \cap \ell_{20} = c_{14} \cap c_{26}$
 $P_{158703} = (46, 46, 37, 1) = \ell_{14} \cap \ell_{22} = c_{14} \cap c_{35}$
 $P_{125447} = (6, 39, 29, 1) = \ell_{14} \cap \ell_{23} = c_{14} \cap c_{36}$
 $P_{191388} = (27, 45, 45, 1) = \ell_{14} \cap \ell_{26} = c_{14} \cap c_{56}$
 $P_{153501} = (28, 29, 36, 1) = \ell_{15} \cap \ell_{17} = c_{15} \cap c_{23}$
 $P_{52468} = (51, 50, 11, 1) = \ell_{15} \cap \ell_{18} = c_{15} \cap c_{24}$
 $P_{11898} = (57, 56, 1, 1) = \ell_{15} \cap \ell_{20} = c_{15} \cap c_{26}$
 $P_{132} = (1, 1, 1, 0) = \ell_{15} \cap \ell_{21} = c_{15} \cap c_{34}$
 $P_{230352} = (15, 14, 55, 1) = \ell_{15} \cap \ell_{23} = c_{15} \cap c_{36}$
 $P_{32831} = (62, 63, 6, 1) = \ell_{15} \cap \ell_{25} = c_{15} \cap c_{46}$
 $P_{238401} = (0, 12, 57, 1) = \ell_{16} \cap \ell_{17} = c_{16} \cap c_{23}$
 $P_{239233} = (0, 25, 57, 1) = \ell_{16} \cap \ell_{18} = c_{16} \cap c_{24}$
 $P_{241217} = (0, 56, 57, 1) = \ell_{16} \cap \ell_{19} = c_{16} \cap c_{25}$
 $P_{237697} = (0, 1, 57, 1) = \ell_{16} \cap \ell_{21} = c_{16} \cap c_{34}$
 $P_{239681} = (0, 32, 57, 1) = \ell_{16} \cap \ell_{22} = c_{16} \cap c_{35}$
 $P_{241025} = (0, 53, 57, 1) = \ell_{16} \cap \ell_{24} = c_{16} \cap c_{45}$
 $P_{5536} = (30, 21, 0, 1) = \ell_{17} \cap \ell_{24} = c_{23} \cap c_{45}$
 $P_{102293} = (20, 61, 23, 1) = \ell_{17} \cap \ell_{25} = c_{23} \cap c_{46}$
 $P_{84515} = (34, 39, 19, 1) = \ell_{17} \cap \ell_{26} = c_{23} \cap c_{56}$
 $P_{4965} = (35, 12, 0, 1) = \ell_{18} \cap \ell_{22} = c_{24} \cap c_{35}$
 $P_{120782} = (13, 30, 28, 1) = \ell_{18} \cap \ell_{23} = c_{24} \cap c_{36}$
 $P_{36946} = (17, 0, 8, 1) = \ell_{18} \cap \ell_{26} = c_{24} \cap c_{56}$
 $P_{7803} = (57, 56, 0, 1) = \ell_{19} \cap \ell_{21} = c_{25} \cap c_{34}$
 $P_{106082} = (33, 56, 24, 1) = \ell_{19} \cap \ell_{23} = c_{25} \cap c_{36}$
 $P_{61045} = (52, 56, 13, 1) = \ell_{19} \cap \ell_{25} = c_{25} \cap c_{46}$
 $P_{11961} = (56, 57, 1, 1) = \ell_{20} \cap \ell_{21} = c_{26} \cap c_{34}$
 $P_{12158} = (61, 60, 1, 1) = \ell_{20} \cap \ell_{22} = c_{26} \cap c_{35}$
 $P_{10468} = (35, 34, 1, 1) = \ell_{20} \cap \ell_{24} = c_{26} \cap c_{45}$
 $P_{88942} = (45, 44, 20, 1) = \ell_{21} \cap \ell_{26} = c_{34} \cap c_{56}$
 $P_{247997} = (60, 33, 59, 1) = \ell_{22} \cap \ell_{25} = c_{35} \cap c_{46}$
 $P_{66564} = (3, 15, 15, 1) = \ell_{23} \cap \ell_{24} = c_{36} \cap c_{45}$

Single Points

The surface has 1488 single points:
Too many to print.

Points on surface but on no line

The surface has 2924 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_{234113}	P_{233985}	P_{236993}	P_{237185}	P_1	P_{236673}	P_{237569}	P_{234433}	P_{233601}	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_{10207}	P_{10857}	P_{9427}	P_{11962}	P_{8258}	P_{12027}	P_{10532}	P_{12222}	P_{11897}	P_5

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_{172384}	P_{143996}	P_{126663}	P_{233104}	P_{9665}	P_{141479}	P_{65604}	P_{104546}	P_{118990}	P_{7117}

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_{258156}	P_{220486}	P_{95473}	P_{32447}	P_{11457}	P_{132116}	P_{247549}	P_{60853}	P_{101077}	P_{4838}

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_{215321}	P_{210680}	P_{250090}	P_{188508}	P_{10049}	P_{201353}	P_{89710}	P_{37458}	P_{85347}	P_{6577}

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_{5823}	P_{47526}	P_{156048}	P_{196661}	P_{200344}	P_{240449}	P_{10271}	P_{175008}	P_{262124}	P_{214105}

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_{10207}	P_{172384}	P_{258156}	P_{215321}	P_{5823}	P_{48166}	P_{157776}	P_{193717}	P_{198104}	P_{238977}

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_{234113}	P_{143996}	P_{220486}	P_{210680}	P_{47526}	P_{7636}	P_{158498}	P_{196031}	P_{200279}	P_{12091}

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_{233985}	P_{10857}	P_{95473}	P_{250090}	P_{156048}	P_{7356}	P_{194891}	P_{153438}	P_{45742}	P_{139367}

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_{236993}	P_{9427}	P_{126663}	P_{188508}	P_{196661}	P_{4650}	P_{156463}	P_{52531}	P_{47561}	P_{132180}

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_{237185}	P_{11962}	P_{233104}	P_{32447}	P_{200344}	P_{7866}	P_{68}	P_{52916}	P_{155293}	P_{204425}

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_{8258}	P_{9665}	P_{11457}	P_{10049}	P_1	P_{8322}	P_{9729}	P_{11521}	P_{10113}

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_{236673}	P_{12027}	P_{48166}	P_{7636}	P_{198167}	P_{194367}	P_{146172}	P_{156642}	P_{217158}	P_{211576}

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_{237569}	P_{141479}	P_{157776}	P_{7356}	P_{45358}	P_{155230}	P_{10921}	P_{193227}	P_{94577}	P_{253930}

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_{234433}	P_{132116}	P_{193717}	P_{4650}	P_{47945}	P_{52851}	P_{9491}	P_{158703}	P_{125447}	P_{191388}

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_{233601}	P_{201353}	P_{198104}	P_{7866}	P_{153501}	P_{52468}	P_{11898}	P_{132}	P_{230352}	P_{32831}

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_{240449}	P_{238977}	P_1	P_{238401}	P_{239233}	P_{241217}	P_{237697}	P_{239681}	P_{241025}

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_{10532}	P_{65604}	P_{158498}	P_{194891}	P_{47945}	P_{153501}	P_{238401}	P_{5536}	P_{102293}	P_{84515}

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_{12222}	P_{247549}	P_{196031}	P_{156463}	P_{45358}	P_{52468}	P_{239233}	P_{4965}	P_{120782}	P_{36946}

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_{11897}	P_{89710}	P_{200279}	P_{68}	P_{155230}	P_{52851}	P_{241217}	P_{7803}	P_{106082}	P_{61045}

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_5	P_{10271}	P_{12091}	P_{8322}	P_{10921}	P_{9491}	P_{11898}	P_{11961}	P_{12158}	P_{10468}

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_{104546}	P_{60853}	P_{153438}	P_{52531}	P_{198167}	P_{132}	P_{237697}	P_{7803}	P_{11961}	P_{88942}

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_{118990}	P_{37458}	P_{45742}	P_{52916}	P_{194367}	P_{158703}	P_{239681}	P_{4965}	P_{12158}	P_{247997}

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_{7117}	P_{175008}	P_{139367}	P_{9729}	P_{146172}	P_{125447}	P_{230352}	P_{120782}	P_{106082}	P_{66564}

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_{101077}	P_{85347}	P_{47561}	P_{155293}	P_{156642}	P_{193227}	P_{241025}	P_{5536}	P_{10468}	P_{66564}

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_{4838}	P_{262124}	P_{132180}	P_{11521}	P_{217158}	P_{94577}	P_{32831}	P_{102293}	P_{61045}	P_{247997}

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_{6577}	P_{214105}	P_{204425}	P_{10113}	P_{211576}	P_{253930}	P_{191388}	P_{84515}	P_{36946}	P_{88942}

The surface has 4545 points:

Too many to print.