Rank-346 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(1, 1, 1, 1, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
The point rank of the equation over GF(64) is 1091051662

General information

Number of lines	27
Number of points	4545
Number of singular points	0
Number of Eckardt points	45
Number of double points	0
Number of single points	1620
Number of points off lines	2880
Number of Hesse planes	40
Number of axes	240
Type of points on lines	65^{27}
Type of lines on points	3^{45}, 1^{1620}, 0^{2880}

Singular Points

The surface has 0 singular points:

The 27 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = a_1 = \begin{bmatrix} 1 & 0 & \epsilon^{21} & 0 \\ 0 & 1 & 1 & \epsilon^{42} \end{bmatrix}_{240762} = \begin{bmatrix} 1 & 0 & 57 & 0 \\ 0 & 1 & 1 & 56 \end{bmatrix}_{240762} = \mathbf{Pl}(57, 56, 57, 0, 57, 1)_{15216704}$$

$$\ell_1 = a_2 = \begin{bmatrix} 1 & 0 & \epsilon^{42} & 0 \\ 0 & 1 & 1 & \epsilon^{21} \end{bmatrix}_{236665} = \begin{bmatrix} 1 & 0 & 56 & 0 \\ 0 & 1 & 1 & 57 \end{bmatrix}_{236665} = \mathbf{Pl}(56, 57, 56, 0, 56, 1)_{14954560}$$

$$\ell_2 = a_3 = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{9} \\ 0 & 1 & \epsilon^{9} & 0 \end{array}\right]_{12516335} = \left[\begin{array}{cccc} 1 & 0 & 0 & 47 \\ 0 & 1 & 47 & 0 \end{array}\right]_{12516335} = \mathbf{Pl}(10, 47, 1, 1, 0, 0)_{265}$$

$$\ell_3 = a_4 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{54} & \epsilon^{27} \\ 0 & 1 & \epsilon^{27} & \epsilon^{54} \end{array}\right]_{12292280} = \left[\begin{array}{cccc} 1 & 0 & 10 & 46 \\ 0 & 1 & 46 & 10 \end{array}\right]_{12292280} = \mathbf{Pl}(37, 11, 46, 36, 1, 1)_{731220}$$

$$\ell_4 = a_5 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{27} & \epsilon^{45} \\ 0 & 1 & \epsilon^{45} & \epsilon^{27} \end{array}\right]_{10047635} = \left[\begin{array}{cccc} 1 & 0 & 46 & 37 \\ 0 & 1 & 37 & 46 \end{array}\right]_{10047635} = \mathbf{Pl}(10, 47, 37, 11, 1, 1)_{695346}$$

$$\ell_5 = a_6 = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{36} \\ 0 & 1 & \epsilon^{18} & 0 \end{array}\right]_{9586955} = \left[\begin{array}{cccc} 1 & 0 & 0 & 36 \\ 0 & 1 & 11 & 0 \end{array}\right]_{9586955} = \mathbf{Pl}(37, 11, 37, 1, 0, 0)_{2560}$$

$$\ell_6 = b_1 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{24} & \epsilon^{54} \\ 0 & 1 & \epsilon^{54} & \epsilon^{3} \end{array}\right]_{2850807} = \left[\begin{array}{cccc} 1 & 0 & 45 & 10 \\ 0 & 1 & 10 & 8 \end{array}\right]_{2850807} = \mathbf{Pl}(33, 49, 52, 54, 56, 1)_{15166784}$$

$$\ell_7 = b_2 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{3} & \epsilon^{54} \\ 0 & 1 & \epsilon^{54} & \epsilon^{24} \end{array}\right]_{2699218} = \left[\begin{array}{cccc} 1 & 0 & 8 & 10 \\ 0 & 1 & 10 & 45 \end{array}\right]_{2699218} = \mathbf{Pl}(15, 21, 62, 25, 57, 1)_{15467906}$$

$$\ell_8 = b_3 = \left[\begin{array}{cccc} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{array}\right]_{270529} = \left[\begin{array}{cccc} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{array}\right]_{270529} = \mathbf{Pl}(1, 1, 0, 1, 1, 1)_{540609}$$

$$\ell_9 = b_4 = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{36} \\ 0 & 1 & \epsilon^{9} & 0 \end{array}\right]_{9586991} = \left[\begin{array}{cccc} 1 & 0 & 0 & 36 \\ 0 & 1 & 47 & 0 \end{array}\right]_{9586991} = \mathbf{Pl}(10, 47, 36, 1, 0, 0)_{2470}$$

$$\ell_{10} = b_5 = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{9} \\ 0 & 1 & \epsilon^{18} & 0 \end{array}\right]_{12516299} = \left[\begin{array}{cccc} 1 & 0 & 0 & 47 \\ 0 & 1 & 11 & 0 \end{array}\right]_{12516299} = \mathbf{Pl}(37, 11, 47, 1, 0, 0)_{3190}$$

$$\ell_{11} = b_6 = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{8258} = \left[\begin{array}{cccc} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{8258} = \mathbf{Pl}(0, 0, 1, 1, 1, 1)_{544578}$$

$$\ell_{12} = c_{12} = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{18} \\ 0 & 1 & \epsilon^{36} & 0 \end{array}\right]_{2929380} = \left[\begin{array}{cccc} 1 & 0 & 0 & 11 \\ 0 & 1 & 36 & 0 \end{array}\right]_{2929380} = \mathbf{Pl}(46, 36, 11, 1, 0, 0)_{931}$$

$$\ell_{13} = c_{13} = \left[\begin{array}{cccc} 1 & \epsilon^{42} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{21} \end{array}\right]_{237169} = \left[\begin{array}{cccc} 1 & 56 & 0 & 0 \\ 0 & 0 & 1 & 57 \end{array}\right]_{237169} = \mathbf{Pl}(0, 0, 56, 57, 56, 1)_{14965963}$$

$$\ell_{14} = c_{14} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{48} & \epsilon^{45} \\ 0 & 1 & \epsilon^{45} & \epsilon^{6} \end{array}\right]_{9917812} = \left[\begin{array}{cccc} 1 & 0 & 15 & 37 \\ 0 & 1 & 37 & 33 \end{array}\right]_{9917812} = \mathbf{Pl}(62, 25, 8, 12, 57, 1)_{15258604}$$

$$\ell_{15} = c_{15} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{12} & \epsilon^{27} \\ 0 & 1 & \epsilon^{27} & \epsilon^{33} \end{array}\right]_{12511340} = \left[\begin{array}{cccc} 1 & 0 & 62 & 46 \\ 0 & 1 & 46 & 52 \end{array}\right]_{12511340} = \mathbf{Pl}(8, 12, 15, 21, 57, 1)_{15286585}$$

$$\ell_{16} = c_{16} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{42} & 1 \\ 0 & 1 & 0 & \epsilon^{21} \end{array}\right]_{502968} = \left[\begin{array}{cccc} 1 & 0 & 56 & 1 \\ 0 & 1 & 0 & 57 \end{array}\right]_{502968} = \mathbf{Pl}(56, 57, 0, 57, 56, 1)_{14958592}$$

$$\ell_{17} = c_{23} = \left[\begin{array}{cccc} 1 & \epsilon^{21} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{42} \end{array}\right]_{241329} = \left[\begin{array}{cccc} 1 & 57 & 0 & 0 \\ 0 & 0 & 1 & 56 \end{array}\right]_{241329} = \mathbf{Pl}(0, 0, 57, 56, 57, 1)_{15228170}$$

$$\ell_{18} = c_{24} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{6} & \epsilon^{45} \\ 0 & 1 & \epsilon^{45} & \epsilon^{48} \end{array}\right]_{9991558} = \left[\begin{array}{cccc} 1 & 0 & 33 & 37 \\ 0 & 1 & 37 & 15 \end{array}\right]_{9991558} = \mathbf{Pl}(52, 54, 45, 7, 56, 1)_{15141036}$$

$$\ell_{19} = c_{25} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{33} & \epsilon^{27} \\ 0 & 1 & \epsilon^{27} & \epsilon^{12} \end{array}\right]_{12470370} = \left[\begin{array}{cccc} 1 & 0 & 52 & 46 \\ 0 & 1 & 46 & 62 \end{array}\right]_{12470370} = \mathbf{Pl}(45, 7, 33, 49, 56, 1)_{15094850}$$

$$\ell_{20} = c_{26} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{21} & 1 \\ 0 & 1 & 0 & \epsilon^{42} \end{array}\right]_{507065} = \left[\begin{array}{cccc} 1 & 0 & 57 & 1 \\ 0 & 1 & 0 & 56 \end{array}\right]_{507065} = \mathbf{Pl}(57, 56, 0, 56, 57, 1)_{15220610}$$

$$\ell_{21} = c_{34} = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{18} \\ 0 & 1 & \epsilon^{9} & 0 \end{array}\right]_{2929391} = \left[\begin{array}{cccc} 1 & 0 & 0 & 11 \\ 0 & 1 & 47 & 0 \end{array}\right]_{2929391} = \mathbf{Pl}(10, 47, 10, 1, 0, 0)_{832}$$

$$\ell_{22} = c_{35} = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{9} \\ 0 & 1 & \epsilon^{36} & 0 \end{array}\right]_{12516324} = \left[\begin{array}{cccc} 1 & 0 & 0 & 47 \\ 0 & 1 & 36 & 0 \end{array}\right]_{12516324} = \mathbf{Pl}(46, 36, 46, 1, 0, 0)_{3136}$$

$$\ell_{23} = c_{36} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{45} & \epsilon^{54} \\ 0 & 1 & \epsilon^{54} & \epsilon^{45} \end{array}\right]_{2819375} = \left[\begin{array}{cccc} 1 & 0 & 37 & 10 \\ 0 & 1 & 10 & 37 \end{array}\right]_{2819375} = \mathbf{Pl}(46,36,10,47,1,1)_{588345}$$

$$\ell_{24} = c_{45} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{array}\right]_{4226} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 1 \end{array}\right]_{4226} = \mathbf{Pl}(1,1,1,0,1,1)_{536640}$$

$$\ell_{25} = c_{46} = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{36} \\ 0 & 1 & \epsilon^{36} & 0 \end{array}\right]_{9586980} = \left[\begin{array}{cccc} 1 & 0 & 0 & 36 \\ 0 & 1 & 36 & 0 \end{array}\right]_{9586980} = \mathbf{Pl}(46,36,1,1,0,0)_{301}$$

$$\ell_{26} = c_{56} = \left[\begin{array}{cccc} 1 & 0 & 0 & \epsilon^{18} \\ 0 & 1 & \epsilon^{18} & 0 \end{array}\right]_{2929355} = \left[\begin{array}{cccc} 1 & 0 & 0 & 11 \\ 0 & 1 & 11 & 0 \end{array}\right]_{2929355} = \mathbf{Pl}(37,11,1,1,0,0)_{292}$$

Rank of lines: (240762, 236665, 12516335, 12292280, 10047635, 9586955, 2850807, 2699218, 270529, 9586991, 12516299, 8258, 2929380, 237169, 9917812, 12511340, 502968, 241329, 9991558, 12470370, 507065, 2929391, 12516324, 2819375, 4226, 9586980, 2929355)
Rank of points on Klein quadric: (15216704, 14954560, 265, 731220, 695346, 2560, 15166784, 15467906, 540609, 2470, 3190, 544578, 931, 14965963, 15258604, 15286585, 14958592, 15228170, 15141036, 15094850, 15220610, 832, 3136, 588345, 536640, 301, 292)

Eckardt Points

The surface has 45 Eckardt points:
$0 : E_{34} = a_3 \cap b_4 \cap c_{34} = P_{707} = \mathbf{P}(0, \epsilon^{54}, 1, 0) = \mathbf{P}(0, 10, 1, 0)$,
$1 : E_{65} = a_6 \cap b_5 \cap c_{56} = P_{2435} = \mathbf{P}(0, \epsilon^{45}, 1, 0) = \mathbf{P}(0, 37, 1, 0)$,
$2 : E_{12,35,46} = c_{12} \cap c_{35} \cap c_{46} = P_{3011} = \mathbf{P}(0, \epsilon^{27}, 1, 0) = \mathbf{P}(0, 46, 1, 0)$,
$3 : E_{35} = a_3 \cap b_5 \cap c_{35} = P_{4172} = \mathbf{P}(\epsilon^{54}, 0, 0, 1) = \mathbf{P}(10, 0, 0, 1)$,
$4 : E_{12,34,56} = c_{12} \cap c_{34} \cap c_{56} = P_{4199} = \mathbf{P}(\epsilon^{45}, 0, 0, 1) = \mathbf{P}(37, 0, 0, 1)$,
$5 : E_{64} = a_6 \cap b_4 \cap c_{46} = P_{4208} = \mathbf{P}(\epsilon^{27}, 0, 0, 1) = \mathbf{P}(46, 0, 0, 1)$,
$6 : E_{36} = a_3 \cap b_6 \cap c_{36} = P_{8907} = \mathbf{P}(\epsilon^{54}, \epsilon^{54}, 1, 1) = \mathbf{P}(10, 10, 1, 1)$,
$7 : E_{56} = a_5 \cap b_6 \cap c_{56} = P_{10662} = \mathbf{P}(\epsilon^{45}, \epsilon^{45}, 1, 1) = \mathbf{P}(37, 37, 1, 1)$,
$8 : E_{46} = a_4 \cap b_6 \cap c_{46} = P_{11247} = \mathbf{P}(\epsilon^{27}, \epsilon^{27}, 1, 1) = \mathbf{P}(46, 46, 1, 1)$,
$9 : E_{26} = a_2 \cap b_6 \cap c_{26} = P_{11897} = \mathbf{P}(\epsilon^{42}, \epsilon^{42}, 1, 1) = \mathbf{P}(56, 56, 1, 1)$,
$10 : E_{16} = a_1 \cap b_6 \cap c_{16} = P_{11962} = \mathbf{P}(\epsilon^{21}, \epsilon^{21}, 1, 1) = \mathbf{P}(57, 57, 1, 1)$,
$11 : E_{15} = a_1 \cap b_5 \cap c_{15} = P_{36491} = \mathbf{P}(\epsilon^{54}, \epsilon^{21}, \epsilon^{39}, 1) = \mathbf{P}(10, 57, 7, 1)$,
$12 : E_{15,26,34} = c_{15} \cap c_{26} \cap c_{34} = P_{40102} = \mathbf{P}(\epsilon^{45}, \epsilon^{57}, \epsilon^{3}, 1) = \mathbf{P}(37, 49, 8, 1)$,
$13 : E_{53} = a_5 \cap b_3 \cap c_{35} = P_{45835} = \mathbf{P}(\epsilon^{54}, \epsilon^{18}, \epsilon^{54}, 1) = \mathbf{P}(10, 11, 10, 1)$,
$14 : E_{45} = a_4 \cap b_5 \cap c_{45} = P_{49291} = \mathbf{P}(\epsilon^{54}, 1, \epsilon^{18}, 1) = \mathbf{P}(10, 1, 11, 1)$,
$15 : E_{25} = a_2 \cap b_5 \cap c_{25} = P_{56907} = \mathbf{P}(\epsilon^{54}, \epsilon^{42}, \epsilon^{60}, 1) = \mathbf{P}(10, 56, 12, 1)$,
$16 : E_{62} = a_6 \cap b_2 \cap c_{26} = P_{69103} = \mathbf{P}(\epsilon^{27}, \epsilon^{30}, \epsilon^{48}, 1) = \mathbf{P}(46, 54, 15, 1)$,
$17 : E_{52} = a_5 \cap b_2 \cap c_{25} = P_{80505} = \mathbf{P}(\epsilon^{42}, \epsilon^{56}, \epsilon^{35}, 1) = \mathbf{P}(56, 40, 18, 1)$,
$18 : E_{21} = a_2 \cap b_1 \cap c_{12} = P_{93798} = \mathbf{P}(\epsilon^{45}, \epsilon^{42}, \epsilon^{15}, 1) = \mathbf{P}(37, 56, 21, 1)$,
$19 : E_{24} = a_2 \cap b_4 \cap c_{24} = P_{110191} = \mathbf{P}(\epsilon^{27}, \epsilon^{42}, \epsilon^{51}, 1) = \mathbf{P}(46, 56, 25, 1)$,
$20 : E_{14,25,36} = c_{14} \cap c_{25} \cap c_{36} = P_{131002} = \mathbf{P}(\epsilon^{21}, \epsilon^{28}, \epsilon^{49}, 1) = \mathbf{P}(57, 61, 30, 1)$,
$21 : E_{61} = a_6 \cap b_1 \cap c_{16} = P_{140975} = \mathbf{P}(\epsilon^{27}, \epsilon^{51}, \epsilon^{6}, 1) = \mathbf{P}(46, 25, 33, 1)$,
$22 : E_{42} = a_4 \cap b_2 \cap c_{24} = P_{149498} = \mathbf{P}(\epsilon^{21}, \epsilon^{49}, \epsilon^{7}, 1) = \mathbf{P}(57, 30, 35, 1)$,
$23 : E_{12,36,45} = c_{12} \cap c_{36} \cap c_{45} = P_{151718} = \mathbf{P}(\epsilon^{45}, 1, \epsilon^{36}, 1) = \mathbf{P}(37, 1, 36, 1)$,
$24 : E_{43} = a_4 \cap b_3 \cap c_{34} = P_{158054} = \mathbf{P}(\epsilon^{45}, \epsilon^{36}, \epsilon^{45}, 1) = \mathbf{P}(37, 36, 37, 1)$,
$25 : E_{41} = a_4 \cap b_1 \cap c_{14} = P_{171769} = \mathbf{P}(\epsilon^{42}, \epsilon^{14}, \epsilon^{56}, 1) = \mathbf{P}(56, 58, 40, 1)$,
$26 : E_{16,25,34} = c_{16} \cap c_{25} \cap c_{34} = P_{189862} = \mathbf{P}(\epsilon^{45}, \epsilon^{15}, \epsilon^{24}, 1) = \mathbf{P}(37, 21, 45, 1)$,
$27 : E_{63} = a_6 \cap b_3 \cap c_{36} = P_{195631} = \mathbf{P}(\epsilon^{27}, \epsilon^{9}, \epsilon^{27}, 1) = \mathbf{P}(46, 47, 46, 1)$,
$28 : E_{54} = a_5 \cap b_4 \cap c_{45} = P_{196783} = \mathbf{P}(\epsilon^{27}, 1, \epsilon^{9}, 1) = \mathbf{P}(46, 1, 47, 1)$,
$29 : E_{12} = a_1 \cap b_2 \cap c_{12} = P_{208550} = \mathbf{P}(\epsilon^{45}, \epsilon^{21}, \epsilon^{57}, 1) = \mathbf{P}(37, 57, 49, 1)$,
$30 : E_{16,24,35} = c_{16} \cap c_{24} \cap c_{35} = P_{217931} = \mathbf{P}(\epsilon^{54}, \epsilon^{60}, \epsilon^{33}, 1) = \mathbf{P}(10, 12, 52, 1)$,
$31 : E_{14} = a_1 \cap b_4 \cap c_{14} = P_{229039} = \mathbf{P}(\epsilon^{27}, \epsilon^{21}, \epsilon^{30}, 1) = \mathbf{P}(46, 57, 54, 1)$,
$32 : E_{13,26,45} = c_{13} \cap c_{26} \cap c_{45} = P_{233658} = \mathbf{P}(\epsilon^{21}, 1, \epsilon^{42}, 1) = \mathbf{P}(57, 1, 56, 1)$,

$33 : E_{13,25,46} = c_{13} \cap c_{25} \cap c_{46} = P_{235695} = \mathbf{P}(\epsilon^{27}, \epsilon^{6}, \epsilon^{42}, 1) = \mathbf{P}(46, 33, 56, 1),$
$34 : E_{13,24,56} = c_{13} \cap c_{24} \cap c_{56} = P_{236454} = \mathbf{P}(\epsilon^{45}, \epsilon^{24}, \epsilon^{42}, 1) = \mathbf{P}(37, 45, 56, 1),$
$35 : E_{31} = a_3 \cap b_1 \cap c_{13} = P_{236875} = \mathbf{P}(\epsilon^{54}, \epsilon^{33}, \epsilon^{42}, 1) = \mathbf{P}(10, 52, 56, 1),$
$36 : E_{13} = a_1 \cap b_3 \cap c_{13} = P_{237241} = \mathbf{P}(\epsilon^{42}, \epsilon^{21}, \epsilon^{42}, 1) = \mathbf{P}(56, 57, 56, 1),$
$37 : E_{16,23,45} = c_{16} \cap c_{23} \cap c_{45} = P_{237753} = \mathbf{P}(\epsilon^{42}, 1, \epsilon^{21}, 1) = \mathbf{P}(56, 1, 57, 1),$
$38 : E_{14,23,56} = c_{14} \cap c_{23} \cap c_{56} = P_{238182} = \mathbf{P}(\epsilon^{45}, \epsilon^{3}, \epsilon^{21}, 1) = \mathbf{P}(37, 8, 57, 1),$
$39 : E_{15,23,46} = c_{15} \cap c_{23} \cap c_{46} = P_{238639} = \mathbf{P}(\epsilon^{27}, \epsilon^{48}, \epsilon^{21}, 1) = \mathbf{P}(46, 15, 57, 1),$
$40 : E_{23} = a_2 \cap b_3 \cap c_{23} = P_{241274} = \mathbf{P}(\epsilon^{21}, \epsilon^{42}, \epsilon^{21}, 1) = \mathbf{P}(57, 56, 57, 1),$
$41 : E_{32} = a_3 \cap b_2 \cap c_{23} = P_{241611} = \mathbf{P}(\epsilon^{54}, \epsilon^{12}, \epsilon^{21}, 1) = \mathbf{P}(10, 62, 57, 1),$
$42 : E_{15,24,36} = c_{15} \cap c_{24} \cap c_{36} = P_{242937} = \mathbf{P}(\epsilon^{42}, \epsilon^{35}, \epsilon^{14}, 1) = \mathbf{P}(56, 18, 58, 1),$
$43 : E_{51} = a_5 \cap b_1 \cap c_{15} = P_{256314} = \mathbf{P}(\epsilon^{21}, \epsilon^{7}, \epsilon^{28}, 1) = \mathbf{P}(57, 35, 61, 1),$
$44 : E_{14,26,35} = c_{14} \cap c_{26} \cap c_{35} = P_{258571} = \mathbf{P}(\epsilon^{54}, \epsilon^{39}, \epsilon^{12}, 1) = \mathbf{P}(10, 7, 62, 1).$

Double Points

The surface has 0 Double points:
The double points on the surface are:

Single Points

The surface has 1620 single points:
Too many to print.

Points on surface but on no line

The surface has 2880 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	1	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_{208550}	P_{237241}	P_{229039}	P_{36491}	P_{11962}	P_{208550}	P_{237241}	P_{229039}	P_{36491}	P_{11962}

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_{93798}	P_{241274}	P_{110191}	P_{56907}	P_{11897}	P_{93798}	P_{241274}	P_{110191}	P_{56907}	P_{11897}

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_{236875}	P_{241611}	P_{707}	P_{4172}	P_{8907}	P_{236875}	P_{241611}	P_{707}	P_{4172}	P_{8907}

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_{171769}	P_{149498}	P_{158054}	P_{49291}	P_{11247}	P_{171769}	P_{149498}	P_{158054}	P_{49291}	P_{11247}

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_{256314}	P_{80505}	P_{45835}	P_{196783}	P_{10662}	P_{256314}	P_{80505}	P_{45835}	P_{196783}	P_{10662}

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_{140975}	P_{69103}	P_{195631}	P_{4208}	P_{2435}	P_{140975}	P_{69103}	P_{195631}	P_{4208}	P_{2435}

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_{93798}	P_{236875}	P_{171769}	P_{256314}	P_{140975}	P_{93798}	P_{236875}	P_{171769}	P_{256314}	P_{140975}

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_{208550}	P_{241611}	P_{149498}	P_{80505}	P_{69103}	P_{208550}	P_{241611}	P_{149498}	P_{80505}	P_{69103}

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_{237241}	P_{241274}	P_{158054}	P_{45835}	P_{195631}	P_{237241}	P_{241274}	P_{158054}	P_{45835}	P_{195631}

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_{229039}	P_{110191}	P_{707}	P_{196783}	P_{4208}	P_{229039}	P_{110191}	P_{707}	P_{196783}	P_{4208}

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_{36491}	P_{56907}	P_{4172}	P_{49291}	P_{2435}	P_{36491}	P_{56907}	P_{4172}	P_{49291}	P_{2435}

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_{11962}	P_{11897}	P_{8907}	P_{11247}	P_{10662}	P_{11962}	P_{11897}	P_{8907}	P_{11247}	P_{10662}

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_{208550}	P_{93798}	P_{93798}	P_{208550}	P_{4199}	P_{3011}	P_{151718}	P_{151718}	P_{3011}	P_{4199}

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_{237241}	P_{236875}	P_{236875}	P_{237241}	P_{236454}	P_{235695}	P_{233658}	P_{233658}	P_{235695}	P_{236454}

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_{229039}	P_{171769}	P_{171769}	P_{229039}	P_{238182}	P_{131002}	P_{258571}	P_{258571}	P_{131002}	P_{238182}

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_{36491}	P_{256314}	P_{256314}	P_{36491}	P_{238639}	P_{242937}	P_{40102}	P_{40102}	P_{242937}	P_{238639}

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_{11962}	P_{140975}	P_{140975}	P_{11962}	P_{237753}	P_{217931}	P_{189862}	P_{189862}	P_{217931}	P_{237753}

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_{241274}	P_{241611}	P_{241611}	P_{241274}	P_{238182}	P_{238639}	P_{237753}	P_{237753}	P_{238639}	P_{238182}

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_{110191}	P_{149498}	P_{149498}	P_{110191}	P_{236454}	P_{242937}	P_{217931}	P_{217931}	P_{242937}	P_{236454}

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_{56907}	P_{80505}	P_{80505}	P_{56907}	P_{235695}	P_{131002}	P_{189862}	P_{189862}	P_{131002}	P_{235695}

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_{11897}	P_{69103}	P_{69103}	P_{11897}	P_{233658}	P_{258571}	P_{40102}	P_{40102}	P_{258571}	P_{233658}

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_{707}	P_{158054}	P_{158054}	P_{707}	P_{4199}	P_{40102}	P_{189862}	P_{189862}	P_{40102}	P_{4199}

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_{4172}	P_{45835}	P_{45835}	P_{4172}	P_{3011}	P_{258571}	P_{217931}	P_{217931}	P_{258571}	P_{3011}

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_{8907}	P_{195631}	P_{195631}	P_{8907}	P_{151718}	P_{131002}	P_{242937}	P_{242937}	P_{131002}	P_{151718}

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_{49291}	P_{196783}	P_{196783}	P_{49291}	P_{151718}	P_{233658}	P_{237753}	P_{237753}	P_{233658}	P_{151718}

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_{11247}	P_{4208}	P_{4208}	P_{11247}	P_{3011}	P_{235695}	P_{238639}	P_{238639}	P_{235695}	P_{3011}

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_{10662}	P_{2435}	P_{2435}	P_{10662}	P_{4199}	P_{236454}	P_{238182}	P_{238182}	P_{236454}	P_{4199}

The surface has 4545 points:
Too many to print.