Rank-65859 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is 1090785349

General information

Number of lines	67
Number of points	4225
Number of singular points	65
Number of Eckardt points	32
Number of double points	66
Number of single points	4127
Number of points off lines	0
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^{67}
Type of lines on points	$3^{32}, 2^{66}, 1^{4127}$

Singular Points

The surface has 65 singular points:

$0: P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$
$1: P_3 = \mathbf{P}(0,0,0,1) = \mathbf{P}(0,0,0,1)$
$2: P_{8258} = \mathbf{P}(0,0,1,1) = \mathbf{P}(0,0,1,1)$
$3: P_{12353} = \mathbf{P}(0,0,\epsilon,1) = \mathbf{P}(0,0,2,1)$
$4: P_{16449} = \mathbf{P}(0,0,\epsilon^{58},1) = \mathbf{P}(0,0,3,1)$
$5: P_{20545} = \mathbf{P}(0,0,\epsilon^2,1) = \mathbf{P}(0,0,4,1)$
$6: P_{24641} = \mathbf{P}(0,0,\epsilon^{53},1) = \mathbf{P}(0,0,5,1)$
$7: P_{28737} = \mathbf{P}(0,0,\epsilon^{59},1) = \mathbf{P}(0,0,6,1)$
$8: P_{32833} = \mathbf{P}(0,0,\epsilon^{39},1) = \mathbf{P}(0,0,7,1)$

$9: P_{36929} = \mathbf{P}(0,0,\epsilon^3,1) = \mathbf{P}(0,0,8,1)$
$10: P_{41025} = \mathbf{P}(0,0,\epsilon^{34},1) = \mathbf{P}(0,0,9,1)$
$11: P_{45121} = \mathbf{P}(0,0,\epsilon^{54},1) = \mathbf{P}(0,0,10,1)$
$12: P_{49217} = \mathbf{P}(0,0,\epsilon^{18},1) = \mathbf{P}(0,0,11,1)$
$13: P_{53313} = \mathbf{P}(0,0,\epsilon^{60},1) = \mathbf{P}(0,0,12,1)$
$14: P_{57409} = \mathbf{P}(0,0,\epsilon^{31},1) = \mathbf{P}(0,0,13,1)$
$15: P_{61505} = \mathbf{P}(0,0,\epsilon^{40},1) = \mathbf{P}(0,0,14,1)$
$16: P_{65601} = \mathbf{P}(0,0,\epsilon^{48},1) = \mathbf{P}(0,0,15,1)$
$17: P_{69697} = \mathbf{P}(0,0,\epsilon^4,1) = \mathbf{P}(0,0,16,1)$

$18: P_{73793} = \mathbf{P}(0, 0, \epsilon^{43}, 1) = \mathbf{P}(0, 0, 17, 1)$

$19: P_{77889} = \mathbf{P}(0, 0, \epsilon^{35}, 1) = \mathbf{P}(0, 0, 18, 1)$

$20: P_{81985} = \mathbf{P}(0, 0, \epsilon^{22}, 1) = \mathbf{P}(0, 0, 19, 1)$

$21: P_{86081} = \mathbf{P}(0, 0, \epsilon^{55}, 1) = \mathbf{P}(0, 0, 20, 1)$

$22: P_{90177} = \mathbf{P}(0, 0, \epsilon^{15}, 1) = \mathbf{P}(0, 0, 21, 1)$

$23: P_{94273} = \mathbf{P}(0, 0, \epsilon^{19}, 1) = \mathbf{P}(0, 0, 22, 1)$

$24: P_{98369} = \mathbf{P}(0, 0, \epsilon^{26}, 1) = \mathbf{P}(0, 0, 23, 1)$

$25: P_{102465} = \mathbf{P}(0, 0, \epsilon^{61}, 1) = \mathbf{P}(0, 0, 24, 1)$

$26: P_{106561} = \mathbf{P}(0, 0, \epsilon^{51}, 1) = \mathbf{P}(0, 0, 25, 1)$

$27: P_{110657} = \mathbf{P}(0, 0, \epsilon^{32}, 1) = \mathbf{P}(0, 0, 26, 1)$

$28: P_{114753} = \mathbf{P}(0, 0, \epsilon^{29}, 1) = \mathbf{P}(0, 0, 27, 1)$

$29: P_{118849} = \mathbf{P}(0, 0, \epsilon^{41}, 1) = \mathbf{P}(0, 0, 28, 1)$

$30: P_{122945} = \mathbf{P}(0, 0, \epsilon^{13}, 1) = \mathbf{P}(0, 0, 29, 1)$

$31: P_{127041} = \mathbf{P}(0, 0, \epsilon^{49}, 1) = \mathbf{P}(0, 0, 30, 1)$

$32: P_{131137} = \mathbf{P}(0, 0, \epsilon^{11}, 1) = \mathbf{P}(0, 0, 31, 1)$

$33: P_{135233} = \mathbf{P}(0, 0, \epsilon^{5}, 1) = \mathbf{P}(0, 0, 32, 1)$

$34: P_{139329} = \mathbf{P}(0, 0, \epsilon^{6}, 1) = \mathbf{P}(0, 0, 33, 1)$

$35: P_{143425} = \mathbf{P}(0, 0, \epsilon^{44}, 1) = \mathbf{P}(0, 0, 34, 1)$

$36: P_{147521} = \mathbf{P}(0, 0, \epsilon^{7}, 1) = \mathbf{P}(0, 0, 35, 1)$

$37: P_{151617} = \mathbf{P}(0, 0, \epsilon^{36}, 1) = \mathbf{P}(0, 0, 36, 1)$

$38: P_{155713} = \mathbf{P}(0, 0, \epsilon^{45}, 1) = \mathbf{P}(0, 0, 37, 1)$

$39: P_{159809} = \mathbf{P}(0, 0, \epsilon^{23}, 1) = \mathbf{P}(0, 0, 38, 1)$

$40: P_{163905} = \mathbf{P}(0, 0, \epsilon^{8}, 1) = \mathbf{P}(0, 0, 39, 1)$

$41: P_{168001} = \mathbf{P}(0, 0, \epsilon^{56}, 1) = \mathbf{P}(0, 0, 40, 1)$

$42: P_{172097} = \mathbf{P}(0, 0, \epsilon^{37}, 1) = \mathbf{P}(0, 0, 41, 1)$

$43: P_{176193} = \mathbf{P}(0, 0, \epsilon^{16}, 1) = \mathbf{P}(0, 0, 42, 1)$

$44: P_{180289} = \mathbf{P}(0, 0, \epsilon^{46}, 1) = \mathbf{P}(0, 0, 43, 1)$

$45: P_{184385} = \mathbf{P}(0, 0, \epsilon^{20}, 1) = \mathbf{P}(0, 0, 44, 1)$

$46: P_{188481} = \mathbf{P}(0, 0, \epsilon^{24}, 1) = \mathbf{P}(0, 0, 45, 1)$

$47: P_{192577} = \mathbf{P}(0, 0, \epsilon^{27}, 1) = \mathbf{P}(0, 0, 46, 1)$

$48: P_{196673} = \mathbf{P}(0, 0, \epsilon^{9}, 1) = \mathbf{P}(0, 0, 47, 1)$

$49: P_{200769} = \mathbf{P}(0, 0, \epsilon^{62}, 1) = \mathbf{P}(0, 0, 48, 1)$

$50: P_{204865} = \mathbf{P}(0, 0, \epsilon^{57}, 1) = \mathbf{P}(0, 0, 49, 1)$

$51: P_{208961} = \mathbf{P}(0, 0, \epsilon^{52}, 1) = \mathbf{P}(0, 0, 50, 1)$

$52: P_{213057} = \mathbf{P}(0, 0, \epsilon^{38}, 1) = \mathbf{P}(0, 0, 51, 1)$

$53: P_{217153} = \mathbf{P}(0, 0, \epsilon^{33}, 1) = \mathbf{P}(0, 0, 52, 1)$

$54: P_{221249} = \mathbf{P}(0, 0, \epsilon^{17}, 1) = \mathbf{P}(0, 0, 53, 1)$

$55: P_{225345} = \mathbf{P}(0, 0, \epsilon^{30}, 1) = \mathbf{P}(0, 0, 54, 1)$

$56: P_{229441} = \mathbf{P}(0, 0, \epsilon^{47}, 1) = \mathbf{P}(0, 0, 55, 1)$

$57: P_{233537} = \mathbf{P}(0, 0, \epsilon^{42}, 1) = \mathbf{P}(0, 0, 56, 1)$

$58: P_{237633} = \mathbf{P}(0, 0, \epsilon^{21}, 1) = \mathbf{P}(0, 0, 57, 1)$

$59: P_{241729} = \mathbf{P}(0, 0, \epsilon^{14}, 1) = \mathbf{P}(0, 0, 58, 1)$

$60: P_{245825} = \mathbf{P}(0, 0, \epsilon^{25}, 1) = \mathbf{P}(0, 0, 59, 1)$

$61: P_{249921} = \mathbf{P}(0, 0, \epsilon^{50}, 1) = \mathbf{P}(0, 0, 60, 1)$

$62: P_{254017} = \mathbf{P}(0, 0, \epsilon^{28}, 1) = \mathbf{P}(0, 0, 61, 1)$

$63: P_{258113} = \mathbf{P}(0, 0, \epsilon^{12}, 1) = \mathbf{P}(0, 0, 62, 1)$

$64: P_{262209} = \mathbf{P}(0, 0, \epsilon^{10}, 1) = \mathbf{P}(0, 0, 63, 1)$

The 67 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{bmatrix}_0 = \mathbf{Pl}(1, 0, 0, 0, 0, 0)_0$$

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4096} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4096} = \mathbf{Pl}(0, 0, 1, 0, 0, 0)_2$$

$$\ell_2 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{8257} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{8257} = \mathbf{Pl}(0, 0, 1, 0, 0, 1)_{270528}$$

$$\ell_3 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043520} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043520} = \mathbf{Pl}(0, 0, 0, 1, 0, 0)_{129}$$

$$\ell_4 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \mathbf{Pl}(0, 1, 0, 0, 0, 0)_1$$

$$\ell_5 = \begin{bmatrix} 1 & \epsilon^{62} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{56} \end{bmatrix}_{203864} = \begin{bmatrix} 1 & 48 & 0 & 0 \\ 0 & 0 & 1 & 40 \end{bmatrix}_{203864} = \mathbf{Pl}(0, 0, 35, 40, 49, 1)_{13128736}$$

$$\ell_6 = \begin{bmatrix} 1 & \epsilon^{5} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{11} \end{bmatrix}_{137279} = \begin{bmatrix} 1 & 32 & 0 & 0 \\ 0 & 0 & 1 & 31 \end{bmatrix}_{137279} = \mathbf{Pl}(0, 0, 50, 31, 33, 1)_{8937361}$$

$$\ell_7 = \begin{bmatrix} 1 & \epsilon^{61} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{49} \end{bmatrix}_{103990} = \begin{bmatrix} 1 & 24 & 0 & 0 \\ 0 & 0 & 1 & 30 \end{bmatrix}_{103990} = \mathbf{Pl}(0, 0, 58, 30, 25, 1)_{6841737}$$

$$\ell_8 = \begin{bmatrix} 1 & \epsilon^{10} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{22} \end{bmatrix}_{266258} = \begin{bmatrix} 1 & 63 & 0 & 0 \\ 0 & 0 & 1 & 19 \end{bmatrix}_{266258} = \mathbf{Pl}(0, 0, 28, 19, 62, 1)_{16534887}$$

$$\ell_9 = \begin{bmatrix} 1 & \epsilon^{4} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{47} \end{bmatrix}_{70727} = \begin{bmatrix} 1 & 16 & 0 & 0 \\ 0 & 0 & 1 & 55 \end{bmatrix}_{70727} = \mathbf{Pl}(0, 0, 42, 55, 17, 1)_{4743065}$$

$$\ell_{10} = \begin{bmatrix} 1 & \epsilon^{24} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{44} \end{bmatrix}_{191375} = \begin{bmatrix} 1 & 45 & 0 & 0 \\ 0 & 0 & 1 & 34 \end{bmatrix}_{191375} = \mathbf{Pl}(0,0,22,34,44,1)_{11816685}$$

$$\ell_{11} = \begin{bmatrix} 1 & \epsilon^{60} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{28} \end{bmatrix}_{54089} = \begin{bmatrix} 1 & 12 & 0 & 0 \\ 0 & 0 & 1 & 61 \end{bmatrix}_{54089} = \mathbf{Pl}(0,0,18,61,13,1)_{3691697}$$

$$\ell_{12} = \begin{bmatrix} 1 & \epsilon^{29} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{61} \end{bmatrix}_{116467} = \begin{bmatrix} 1 & 27 & 0 & 0 \\ 0 & 0 & 1 & 24 \end{bmatrix}_{116467} = \mathbf{Pl}(0,0,4,24,26,1)_{7096959}$$

$$\ell_{13} = \begin{bmatrix} 1 & \epsilon^{9} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{36} \end{bmatrix}_{199699} = \begin{bmatrix} 1 & 47 & 0 & 0 \\ 0 & 0 & 1 & 36 \end{bmatrix}_{199699} = \mathbf{Pl}(0,0,46,36,46,1)_{12343893}$$

$$\ell_{14} = \begin{bmatrix} 1 & \epsilon^{45} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{18} \end{bmatrix}_{158064} = \begin{bmatrix} 1 & 37 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{158064} = \mathbf{Pl}(0,0,37,11,36,1)_{9721950}$$

$$\ell_{15} = \begin{bmatrix} 1 & \epsilon^{3} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{37} \end{bmatrix}_{37425} = \begin{bmatrix} 1 & 8 & 0 & 0 \\ 0 & 0 & 1 & 41 \end{bmatrix}_{37425} = \mathbf{Pl}(0,0,23,41,9,1)_{2644012}$$

$$\ell_{16} = \begin{bmatrix} 1 & \epsilon^{32} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{61} \end{bmatrix}_{112306} = \begin{bmatrix} 1 & 26 & 0 & 0 \\ 0 & 0 & 1 & 24 \end{bmatrix}_{112306} = \mathbf{Pl}(0,0,4,24,27,1)_{7359039}$$

$$\ell_{17} = \begin{bmatrix} 1 & \epsilon^{23} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{31} \end{bmatrix}_{162227} = \begin{bmatrix} 1 & 38 & 0 & 0 \\ 0 & 0 & 1 & 13 \end{bmatrix}_{162227} = \mathbf{Pl}(0,0,26,13,39,1)_{10506793}$$

$$\ell_{18} = \begin{bmatrix} 1 & \epsilon^{15} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{7} \end{bmatrix}_{91512} = \begin{bmatrix} 1 & 21 & 0 & 0 \\ 0 & 0 & 1 & 35 \end{bmatrix}_{91512} = \mathbf{Pl}(0,0,40,35,20,1)_{5529051}$$

$$\ell_{19} = \begin{bmatrix} 1 & \epsilon^{59} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{35} \end{bmatrix}_{29080} = \begin{bmatrix} 1 & 6 & 0 & 0 \\ 0 & 0 & 1 & 18 \end{bmatrix}_{29080} = \mathbf{Pl}(0,0,61,18,7,1)_{2124678}$$

$$\ell_{20} = \begin{bmatrix} 1 & \epsilon^{20} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{44} \end{bmatrix}_{187214} = \begin{bmatrix} 1 & 44 & 0 & 0 \\ 0 & 0 & 1 & 34 \end{bmatrix}_{187214} = \mathbf{Pl}(0,0,22,34,45,1)_{12078765}$$

$$\ell_{21} = \begin{bmatrix} 1 & \epsilon^{28} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{15} \end{bmatrix}_{257938} = \begin{bmatrix} 1 & 61 & 0 & 0 \\ 0 & 0 & 1 & 21 \end{bmatrix}_{257938} = \mathbf{Pl}(0,0,15,21,60,1)_{16009076}$$

$$\ell_{22} = \begin{bmatrix} 1 & \epsilon^{41} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{54} \end{bmatrix}_{120614} = \begin{bmatrix} 1 & 28 & 0 & 0 \\ 0 & 0 & 1 & 10 \end{bmatrix}_{120614} = \mathbf{Pl}(0,0,47,10,29,1)_{7888660}$$

$$\ell_{23} = \begin{bmatrix} 1 & \epsilon^{8} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{31} \end{bmatrix}_{166388} = \begin{bmatrix} 1 & 39 & 0 & 0 \\ 0 & 0 & 1 & 13 \end{bmatrix}_{166388} = \mathbf{Pl}(0,0,26,13,38,1)_{10244713}$$

$$\ell_{24} = \begin{bmatrix} 1 & \epsilon^{48} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{25} \end{bmatrix}_{66570} = \begin{bmatrix} 1 & 15 & 0 & 0 \\ 0 & 0 & 1 & 59 \end{bmatrix}_{66570} = \mathbf{Pl}(0,0,51,59,14,1)_{3957968}$$

$$\ell_{25} = \begin{bmatrix} 1 & \epsilon^{44} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{51} \end{bmatrix}_{145595} = \begin{bmatrix} 1 & 34 & 0 & 0 \\ 0 & 0 & 1 & 25 \end{bmatrix}_{145595} = \mathbf{Pl}(0,0,62,25,35,1)_{9463045}$$

$$\ell_{26} = \begin{bmatrix} 1 & \epsilon^{37} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{30} \end{bmatrix}_{174751} = \begin{bmatrix} 1 & 41 & 0 & 0 \\ 0 & 0 & 1 & 54 \end{bmatrix}_{174751} = \mathbf{Pl}(0,0,52,54,40,1)_{10772175}$$

$$\ell_{27} = \begin{bmatrix} 1 & \epsilon^{2} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{55} \end{bmatrix}_{20760} = \begin{bmatrix} 1 & 4 & 0 & 0 \\ 0 & 0 & 1 & 20 \end{bmatrix}_{20760} = \mathbf{Pl}(0,0,39,20,5,1)_{1597724}$$

$$\ell_{28} = \begin{bmatrix} 1 & \epsilon^{12} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{22} \end{bmatrix}_{262097} = \begin{bmatrix} 1 & 62 & 0 & 0 \\ 0 & 0 & 1 & 19 \end{bmatrix}_{262097} = \mathbf{Pl}(0,0,28,19,63,1)_{16796967}$$

$$\ell_{29} = \begin{bmatrix} 1 & \epsilon^{31} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{28} \end{bmatrix}_{58250} = \begin{bmatrix} 1 & 13 & 0 & 0 \\ 0 & 0 & 1 & 61 \end{bmatrix}_{58250} = \mathbf{Pl}(0,0,18,61,12,1)_{3429617}$$

$$\ell_{30} = \begin{bmatrix} 1 & \epsilon^{34} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{37} \end{bmatrix}_{41586} = \begin{bmatrix} 1 & 9 & 0 & 0 \\ 0 & 0 & 1 & 41 \end{bmatrix}_{41586} = \mathbf{Pl}(0,0,23,41,8,1)_{2381932}$$

$$\ell_{31} = \begin{bmatrix} 1 & \epsilon^{22} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{57} \end{bmatrix}_{83204} = \begin{bmatrix} 1 & 19 & 0 & 0 \\ 0 & 0 & 1 & 49 \end{bmatrix}_{83204} = \mathbf{Pl}(0,0,33,49,18,1)_{5004002}$$

$$\ell_{32} = \begin{bmatrix} 1 & \epsilon^{50} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{15} \end{bmatrix}_{253777} = \begin{bmatrix} 1 & 60 & 0 & 0 \\ 0 & 0 & 1 & 21 \end{bmatrix}_{253777} = \mathbf{Pl}(0,0,15,21,61,1)_{16271156}$$

$$\ell_{33} = \begin{bmatrix} 1 & \epsilon^{14} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{39} \end{bmatrix}_{245441} = \begin{bmatrix} 1 & 58 & 0 & 0 \\ 0 & 0 & 1 & 7 \end{bmatrix}_{245441} = \mathbf{Pl}(0,0,45,7,59,1)_{15750806}$$

$$\ell_{34} = \begin{bmatrix} 1 & \epsilon^{52} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{27} \end{bmatrix}_{212192} = \begin{bmatrix} 1 & 50 & 0 & 0 \\ 0 & 0 & 1 & 46 \end{bmatrix}_{212192} = \mathbf{Pl}(0,0,36,46,51,1)_{13653023}$$

$$\ell_{35} = \begin{bmatrix} 1 & \epsilon^{58} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{59} \end{bmatrix}_{16585} = \begin{bmatrix} 1 & 3 & 0 & 0 \\ 0 & 0 & 1 & 6 \end{bmatrix}_{16585} = \mathbf{Pl}(0,0,16,6,2,1)_{808563}$$

$$\ell_{36} = \begin{bmatrix} 1 & \epsilon^{57} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{56} \end{bmatrix}_{208025} = \begin{bmatrix} 1 & 49 & 0 & 0 \\ 0 & 0 & 1 & 40 \end{bmatrix}_{208025} = \mathbf{Pl}(0,0,35,40,48,1)_{12866656}$$

$$\ell_{37} = \begin{bmatrix} 1 & \epsilon^{19} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{45} \end{bmatrix}_{95675} = \begin{bmatrix} 1 & 22 & 0 & 0 \\ 0 & 0 & 1 & 37 \end{bmatrix}_{95675} = \mathbf{Pl}(0,0,11,37,23,1)_{6311608}$$

$$\ell_{38} = \begin{bmatrix} 1 & \epsilon^{56} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{30} \end{bmatrix}_{170590} = \begin{bmatrix} 1 & 40 & 0 & 0 \\ 0 & 0 & 1 & 54 \end{bmatrix}_{170590} = \mathbf{Pl}(0,0,52,54,41,1)_{11034255}$$

$$\ell_{39} = \begin{bmatrix} 1 & \epsilon^{27} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{36} \end{bmatrix}_{195538} = \begin{bmatrix} 1 & 46 & 0 & 0 \\ 0 & 0 & 1 & 36 \end{bmatrix}_{195538} = \mathbf{Pl}(0,0,46,36,47,1)_{12605973}$$

$$\ell_{40} = \begin{bmatrix} 1 & \epsilon^{18} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{9} \end{bmatrix}_{49914} = \begin{bmatrix} 1 & 11 & 0 & 0 \\ 0 & 0 & 1 & 47 \end{bmatrix}_{49914} = \mathbf{Pl}(0,0,10,47,10,1)_{2904441}$$

$$\ell_{41} = \begin{bmatrix} 1 & \epsilon^{40} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{25} \end{bmatrix}_{62409} = \begin{bmatrix} 1 & 14 & 0 & 0 \\ 0 & 0 & 1 & 59 \end{bmatrix}_{62409} = \mathbf{Pl}(0,0,51,59,15,1)_{4220048}$$

$$\ell_{42} = \begin{bmatrix} 1 & \epsilon^{55} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{7} \end{bmatrix}_{87351} = \begin{bmatrix} 1 & 20 & 0 & 0 \\ 0 & 0 & 1 & 35 \end{bmatrix}_{87351} = \mathbf{Pl}(0,0,40,35,21,1)_{5791131}$$

$$\ell_{43} = \begin{bmatrix} 1 & \epsilon^{7} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{51} \end{bmatrix}_{149756} = \begin{bmatrix} 1 & 35 & 0 & 0 \\ 0 & 0 & 1 & 25 \end{bmatrix}_{149756} = \mathbf{Pl}(0,0,62,25,34,1)_{9200965}$$

$$\ell_{44} = \begin{bmatrix} 1 & \epsilon^{26} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{45} \end{bmatrix}_{99836} = \begin{bmatrix} 1 & 23 & 0 & 0 \\ 0 & 0 & 1 & 37 \end{bmatrix}_{99836} = \mathbf{Pl}(0,0,11,37,22,1)_{6049528}$$

$$\ell_{45} = \begin{bmatrix} 1 & \epsilon^{47} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{14} \end{bmatrix}_{233009} = \begin{bmatrix} 1 & 55 & 0 & 0 \\ 0 & 0 & 1 & 58 \end{bmatrix}_{233009} = \mathbf{Pl}(0,0,30,58,54,1)_{14438501}$$

$$\ell_{46} = \begin{bmatrix} 1 & \epsilon^{17} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{50} \end{bmatrix}_{224689} = \begin{bmatrix} 1 & 53 & 0 & 0 \\ 0 & 0 & 1 & 60 \end{bmatrix}_{224689} = \mathbf{Pl}(0,0,29,60,52,1)_{13914214}$$

$$\ell_{47} = \begin{bmatrix} 1 & \epsilon^{43} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{47} \end{bmatrix}_{74888} = \begin{bmatrix} 1 & 17 & 0 & 0 \\ 0 & 0 & 1 & 55 \end{bmatrix}_{74888} = \mathbf{Pl}(0,0,42,55,16,1)_{4480985}$$

$$\ell_{48} = \begin{bmatrix} 1 & \epsilon^{39} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{35} \end{bmatrix}_{33241} = \begin{bmatrix} 1 & 7 & 0 & 0 \\ 0 & 0 & 1 & 18 \end{bmatrix}_{33241} = \mathbf{Pl}(0,0,61,18,6,1)_{1862598}$$

$$\ell_{49} = \begin{bmatrix} 1 & \epsilon^{36} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{18} \end{bmatrix}_{153903} = \begin{bmatrix} 1 & 36 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{153903} = \mathbf{Pl}(0,0,37,11,37,1)_{9984030}$$

$$\ell_{50} = \begin{bmatrix} 1 & \epsilon^{54} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{9} \end{bmatrix}_{45753} = \begin{bmatrix} 1 & 10 & 0 & 0 \\ 0 & 0 & 1 & 47 \end{bmatrix}_{45753} = \mathbf{Pl}(0,0,10,47,11,1)_{3166521}$$

$$\ell_{51} = \begin{bmatrix} 1 & \epsilon & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{59} \end{bmatrix}_{12424} = \begin{bmatrix} 1 & 2 & 0 & 0 \\ 0 & 0 & 1 & 6 \end{bmatrix}_{12424} = \mathbf{Pl}(0,0,16,6,3,1)_{1070643}$$

4

$$\ell_{52} = \begin{bmatrix} 1 & \epsilon^6 & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{11} \end{bmatrix}_{141440} = \begin{bmatrix} 1 & 33 & 0 & 0 \\ 0 & 0 & 1 & 31 \end{bmatrix}_{141440} = \mathbf{Pl}(0,0,50,31,32,1)_{8675281}$$

$$\ell_{53} = \begin{bmatrix} 1 & \epsilon^{11} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{60} \end{bmatrix}_{133099} = \begin{bmatrix} 1 & 31 & 0 & 0 \\ 0 & 0 & 1 & 12 \end{bmatrix}_{133099} = \mathbf{Pl}(0,0,8,12,30,1)_{8145787}$$

$$\ell_{54} = \begin{bmatrix} 1 & \epsilon^{25} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{39} \end{bmatrix}_{249602} = \begin{bmatrix} 1 & 59 & 0 & 0 \\ 0 & 0 & 1 & 7 \end{bmatrix}_{249602} = \mathbf{Pl}(0,0,45,7,58,1)_{15488726}$$

$$\ell_{55} = \begin{bmatrix} 1 & \epsilon^{30} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{14} \end{bmatrix}_{228848} = \begin{bmatrix} 1 & 54 & 0 & 0 \\ 0 & 0 & 1 & 58 \end{bmatrix}_{228848} = \mathbf{Pl}(0,0,30,58,55,1)_{14700581}$$

$$\ell_{56} = \begin{bmatrix} 1 & \epsilon^{46} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{62} \end{bmatrix}_{183067} = \begin{bmatrix} 1 & 43 & 0 & 0 \\ 0 & 0 & 1 & 48 \end{bmatrix}_{183067} = \mathbf{Pl}(0,0,2,48,42,1)_{11289985}$$

$$\ell_{57} = \begin{bmatrix} 1 & \epsilon^{33} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{50} \end{bmatrix}_{220528} = \begin{bmatrix} 1 & 52 & 0 & 0 \\ 0 & 0 & 1 & 60 \end{bmatrix}_{220528} = \mathbf{Pl}(0,0,29,60,53,1)_{14176294}$$

$$\ell_{58} = \begin{bmatrix} 1 & \epsilon^{16} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{62} \end{bmatrix}_{178906} = \begin{bmatrix} 1 & 42 & 0 & 0 \\ 0 & 0 & 1 & 48 \end{bmatrix}_{178906} = \mathbf{Pl}(0,0,2,48,43,1)_{11552065}$$

$$\ell_{59} = \begin{bmatrix} 1 & \epsilon^{21} & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{241274} = \begin{bmatrix} 1 & 57 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{241274} = \mathbf{Pl}(0,0,1,1,56,1)_{14958978}$$

$$\ell_{60} = \begin{bmatrix} 1 & \epsilon^{42} & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{237113} = \begin{bmatrix} 1 & 56 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{237113} = \mathbf{Pl}(0,0,1,1,57,1)_{15221058}$$

$$\ell_{61} = \begin{bmatrix} 1 & \epsilon^{49} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{60} \end{bmatrix}_{128938} = \begin{bmatrix} 1 & 30 & 0 & 0 \\ 0 & 0 & 1 & 12 \end{bmatrix}_{128938} = \mathbf{Pl}(0,0,8,12,31,1)_{8407867}$$

$$\ell_{62} = \begin{bmatrix} 1 & \epsilon^{38} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{27} \end{bmatrix}_{216353} = \begin{bmatrix} 1 & 51 & 0 & 0 \\ 0 & 0 & 1 & 46 \end{bmatrix}_{216353} = \mathbf{Pl}(0,0,36,46,50,1)_{13390943}$$

$$\ell_{63} = \begin{bmatrix} 1 & \epsilon^{13} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{54} \end{bmatrix}_{124775} = \begin{bmatrix} 1 & 29 & 0 & 0 \\ 0 & 0 & 1 & 10 \end{bmatrix}_{124775} = \mathbf{Pl}(0,0,47,10,28,1)_{7626580}$$

$$\ell_{64} = \begin{bmatrix} 1 & \epsilon^{35} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{57} \end{bmatrix}_{79043} = \begin{bmatrix} 1 & 18 & 0 & 0 \\ 0 & 0 & 1 & 49 \end{bmatrix}_{79043} = \mathbf{Pl}(0,0,33,49,19,1)_{5266082}$$

$$\ell_{65} = \begin{bmatrix} 1 & \epsilon^{51} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{49} \end{bmatrix}_{108151} = \begin{bmatrix} 1 & 25 & 0 & 0 \\ 0 & 0 & 1 & 30 \end{bmatrix}_{108151} = \mathbf{Pl}(0,0,58,30,24,1)_{6579657}$$

$$\ell_{66} = \begin{bmatrix} 1 & \epsilon^{53} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{55} \end{bmatrix}_{24921} = \begin{bmatrix} 1 & 5 & 0 & 0 \\ 0 & 0 & 1 & 20 \end{bmatrix}_{24921} = \mathbf{Pl}(0,0,39,20,4,1)_{1335644}$$

Rank of lines: (0, 4096, 8257, 17043520, 17047616, 203864, 137279, 103990, 266258, 70727, 191375, 54089, 116467, 199699, 158064, 37425, 112306, 162227, 91512, 29080, 187214, 257938, 120614, 166388, 66570, 145595, 174751, 20760, 262097, 58250, 41586, 83204, 253777, 245441, 212192, 16585, 208025, 95675, 170590, 195538, 49914, 62409, 87351, 149756, 99836, 233009, 224689, 74888, 33241, 153903, ...79043, 108151, 24921)

Rank of points on Klein quadric: (0, 2, 270528, 129, 1, 13128736, 8937361, 6841737, 16534887, 4743065, 11816685, 3691697, 7096959, 12343893, 9721950, 2644012, 7359039, 10506793, 5529051, 2124678, 12078765, 16009076, 7888660, 10244713, 3957968, 9463045, 10772175, 1597724, 16796967, 3429617, 2381932, 5004002, 16271156, 15750806, 13653023, 808563, 12866656, 6311608, 11034255, 12605973, 2904441, 4220048, 5791131, 9200965, 6049528, 14438501, 13914214, 4480985, 1862598, 9984030, ...5266082, 6579657, 1335644)

Eckardt Points

The surface has 32 Eckardt points:
$0 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$,
$1 : P_{8258} = \mathbf{P}(0,0,1,1) = \mathbf{P}(0,0,1,1)$,
$2 : P_{12353} = \mathbf{P}(0,0,\epsilon,1) = \mathbf{P}(0,0,2,1)$,
$3 : P_{20545} = \mathbf{P}(0,0,\epsilon^2,1) = \mathbf{P}(0,0,4,1)$,
$4 : P_{36929} = \mathbf{P}(0,0,\epsilon^3,1) = \mathbf{P}(0,0,8,1)$,
$5 : P_{45121} = \mathbf{P}(0,0,\epsilon^{54},1) = \mathbf{P}(0,0,10,1)$,
$6 : P_{49217} = \mathbf{P}(0,0,\epsilon^{18},1) = \mathbf{P}(0,0,11,1)$,
$7 : P_{65601} = \mathbf{P}(0,0,\epsilon^{48},1) = \mathbf{P}(0,0,15,1)$,
$8 : P_{69697} = \mathbf{P}(0,0,\epsilon^4,1) = \mathbf{P}(0,0,16,1)$,
$9 : P_{77889} = \mathbf{P}(0,0,\epsilon^{35},1) = \mathbf{P}(0,0,18,1)$,
$10 : P_{94273} = \mathbf{P}(0,0,\epsilon^{19},1) = \mathbf{P}(0,0,22,1)$,
$11 : P_{98369} = \mathbf{P}(0,0,\epsilon^{26},1) = \mathbf{P}(0,0,23,1)$,
$12 : P_{110657} = \mathbf{P}(0,0,\epsilon^{32},1) = \mathbf{P}(0,0,26,1)$,
$13 : P_{118849} = \mathbf{P}(0,0,\epsilon^{41},1) = \mathbf{P}(0,0,28,1)$,
$14 : P_{122945} = \mathbf{P}(0,0,\epsilon^{13},1) = \mathbf{P}(0,0,29,1)$,
$15 : P_{127041} = \mathbf{P}(0,0,\epsilon^{49},1) = \mathbf{P}(0,0,30,1)$,
$16 : P_{139329} = \mathbf{P}(0,0,\epsilon^6,1) = \mathbf{P}(0,0,33,1)$,
$17 : P_{147521} = \mathbf{P}(0,0,\epsilon^7,1) = \mathbf{P}(0,0,35,1)$,
$18 : P_{151617} = \mathbf{P}(0,0,\epsilon^{36},1) = \mathbf{P}(0,0,36,1)$,
$19 : P_{155713} = \mathbf{P}(0,0,\epsilon^{45},1) = \mathbf{P}(0,0,37,1)$,
$20 : P_{163905} = \mathbf{P}(0,0,\epsilon^8,1) = \mathbf{P}(0,0,39,1)$,
$21 : P_{168001} = \mathbf{P}(0,0,\epsilon^{56},1) = \mathbf{P}(0,0,40,1)$,
$22 : P_{176193} = \mathbf{P}(0,0,\epsilon^{16},1) = \mathbf{P}(0,0,42,1)$,
$23 : P_{188481} = \mathbf{P}(0,0,\epsilon^{24},1) = \mathbf{P}(0,0,45,1)$,
$24 : P_{192577} = \mathbf{P}(0,0,\epsilon^{27},1) = \mathbf{P}(0,0,46,1)$,
$25 : P_{196673} = \mathbf{P}(0,0,\epsilon^9,1) = \mathbf{P}(0,0,47,1)$,
$26 : P_{208961} = \mathbf{P}(0,0,\epsilon^{52},1) = \mathbf{P}(0,0,50,1)$,
$27 : P_{213057} = \mathbf{P}(0,0,\epsilon^{38},1) = \mathbf{P}(0,0,51,1)$,
$28 : P_{217153} = \mathbf{P}(0,0,\epsilon^{33},1) = \mathbf{P}(0,0,52,1)$,
$29 : P_{241729} = \mathbf{P}(0,0,\epsilon^{14},1) = \mathbf{P}(0,0,58,1)$,
$30 : P_{254017} = \mathbf{P}(0,0,\epsilon^{28},1) = \mathbf{P}(0,0,61,1)$,
$31 : P_{258113} = \mathbf{P}(0,0,\epsilon^{12},1) = \mathbf{P}(0,0,62,1)$.

Double Points

The surface has 66 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$

$P_5 = (1,1,0,0) = \ell_0 \cap \ell_2$

$P_1 = (0,1,0,0) = \ell_0 \cap \ell_3$

$P_6 = (2,1,0,0) = \ell_0 \cap \ell_5$

$P_7 = (3,1,0,0) = \ell_0 \cap \ell_6$

$P_8 = (4,1,0,0) = \ell_0 \cap \ell_7$

$P_9 = (5,1,0,0) = \ell_0 \cap \ell_8$

$P_{10} = (6,1,0,0) = \ell_0 \cap \ell_9$

$P_{11} = (7,1,0,0) = \ell_0 \cap \ell_{10}$

$P_{12} = (8,1,0,0) = \ell_0 \cap \ell_{11}$

$P_{13} = (9,1,0,0) = \ell_0 \cap \ell_{12}$

$P_{14} = (10,1,0,0) = \ell_0 \cap \ell_{13}$

$P_{15} = (11,1,0,0) = \ell_0 \cap \ell_{14}$

$P_{16} = (12,1,0,0) = \ell_0 \cap \ell_{15}$

$P_{17} = (13,1,0,0) = \ell_0 \cap \ell_{16}$

$P_{18} = (14,1,0,0) = \ell_0 \cap \ell_{17}$

$P_{19} = (15,1,0,0) = \ell_0 \cap \ell_{18}$

$P_{20} = (16,1,0,0) = \ell_0 \cap \ell_{19}$

$P_{21} = (17,1,0,0) = \ell_0 \cap \ell_{20}$

$P_{22} = (18,1,0,0) = \ell_0 \cap \ell_{21}$

$P_{23} = (19,1,0,0) = \ell_0 \cap \ell_{22}$

$P_{24} = (20,1,0,0) = \ell_0 \cap \ell_{23}$

$P_{25} = (21,1,0,0) = \ell_0 \cap \ell_{24}$

$P_{26} = (22,1,0,0) = \ell_0 \cap \ell_{25}$

$P_{27} = (23, 1, 0, 0) = \ell_0 \cap \ell_{26}$

$P_{28} = (24, 1, 0, 0) = \ell_0 \cap \ell_{27}$

$P_{29} = (25, 1, 0, 0) = \ell_0 \cap \ell_{28}$

$P_{30} = (26, 1, 0, 0) = \ell_0 \cap \ell_{29}$

$P_{31} = (27, 1, 0, 0) = \ell_0 \cap \ell_{30}$

$P_{32} = (28, 1, 0, 0) = \ell_0 \cap \ell_{31}$

$P_{33} = (29, 1, 0, 0) = \ell_0 \cap \ell_{32}$

$P_{34} = (30, 1, 0, 0) = \ell_0 \cap \ell_{33}$

$P_{35} = (31, 1, 0, 0) = \ell_0 \cap \ell_{34}$

$P_{36} = (32, 1, 0, 0) = \ell_0 \cap \ell_{35}$

$P_{37} = (33, 1, 0, 0) = \ell_0 \cap \ell_{36}$

$P_{38} = (34, 1, 0, 0) = \ell_0 \cap \ell_{37}$

$P_{39} = (35, 1, 0, 0) = \ell_0 \cap \ell_{38}$

$P_{40} = (36, 1, 0, 0) = \ell_0 \cap \ell_{39}$

$P_{41} = (37, 1, 0, 0) = \ell_0 \cap \ell_{40}$

$P_{42} = (38, 1, 0, 0) = \ell_0 \cap \ell_{41}$

$P_{43} = (39, 1, 0, 0) = \ell_0 \cap \ell_{42}$

$P_{44} = (40, 1, 0, 0) = \ell_0 \cap \ell_{43}$

$P_{45} = (41, 1, 0, 0) = \ell_0 \cap \ell_{44}$

$P_{46} = (42, 1, 0, 0) = \ell_0 \cap \ell_{45}$

$P_{47} = (43, 1, 0, 0) = \ell_0 \cap \ell_{46}$

$P_{48} = (44, 1, 0, 0) = \ell_0 \cap \ell_{47}$

$P_{49} = (45, 1, 0, 0) = \ell_0 \cap \ell_{48}$

$P_{50} = (46, 1, 0, 0) = \ell_0 \cap \ell_{49}$

$P_{51} = (47, 1, 0, 0) = \ell_0 \cap \ell_{50}$

$P_{52} = (48, 1, 0, 0) = \ell_0 \cap \ell_{51}$

$P_{53} = (49, 1, 0, 0) = \ell_0 \cap \ell_{52}$

$P_{54} = (50, 1, 0, 0) = \ell_0 \cap \ell_{53}$

$P_{55} = (51, 1, 0, 0) = \ell_0 \cap \ell_{54}$

$P_{56} = (52, 1, 0, 0) = \ell_0 \cap \ell_{55}$

$P_{57} = (53, 1, 0, 0) = \ell_0 \cap \ell_{56}$

$P_{58} = (54, 1, 0, 0) = \ell_0 \cap \ell_{57}$

$P_{59} = (55, 1, 0, 0) = \ell_0 \cap \ell_{58}$

$P_{60} = (56, 1, 0, 0) = \ell_0 \cap \ell_{59}$

$P_{61} = (57, 1, 0, 0) = \ell_0 \cap \ell_{60}$

$P_{62} = (58, 1, 0, 0) = \ell_0 \cap \ell_{61}$

$P_{63} = (59, 1, 0, 0) = \ell_0 \cap \ell_{62}$

$P_{64} = (60, 1, 0, 0) = \ell_0 \cap \ell_{63}$

$P_{65} = (61, 1, 0, 0) = \ell_0 \cap \ell_{64}$

$P_{66} = (62, 1, 0, 0) = \ell_0 \cap \ell_{65}$

$P_{67} = (63, 1, 0, 0) = \ell_0 \cap \ell_{66}$

$P_3 = (0, 0, 0, 1) = \ell_3 \cap \ell_4$

Single Points

The surface has 4127 single points:
Too many to print.

Points on surface but on no line

The surface has 0 points not on any line:
The points on the surface but not on lines are:

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	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
5	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
6	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
14	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
19	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
25	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
26	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
27	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
32	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
34	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
38	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
48	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
50	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
51	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
52	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
54	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
55	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
56	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{17}	ℓ_{18}	ℓ_{19}	ℓ_{20}	ℓ_{21}	ℓ_{22}
in point	P_0	P_5	P_1	P_6	P_7	P_8	P_9	P_{10}	P_{11}	P_{12}	P_{13}	P_{14}	P_{15}	P_{16}	P_{17}	P_{18}	P_{19}	P_{20}	P_{21}	P_{22}	P_{23}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_4
in point	P_0	P_2	P_2

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_4
in point	P_5	P_2	P_2

Line 3 intersects

Line	ℓ_0	ℓ_4
in point	P_1	P_3

Line 4 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_5	ℓ_6	ℓ_7	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{15}
in point	P_2	P_2	P_3	P_{147521}	P_{208961}	P_{241729}	P_{118849}	P_{176193}	P_{94273}	P_{77889}	P_{20545}	P_{192577}	P_{155713}	P_{98369}

Line 5 intersects

Line	ℓ_0	ℓ_4	ℓ_{36}
in point	P_6	P_{147521}	P_{147521}

Line 6 intersects

Line	ℓ_0	ℓ_4	ℓ_{52}
in point	P_7	P_{208961}	P_{208961}

Line 7 intersects

Line	ℓ_0	ℓ_4	ℓ_{65}
in point	P_8	P_{241729}	P_{241729}

Line 8 intersects

Line	ℓ_0	ℓ_4	ℓ_{28}
in point	P_9	P_{118849}	P_{118849}

Line 9 intersects

Line	ℓ_0	ℓ_4	ℓ_{47}
in point	P_{10}	P_{176193}	P_{176193}

Line 10 intersects

Line	ℓ_0	ℓ_4	ℓ_{20}
in point	P_{11}	P_{94273}	P_{94273}

Line 11 intersects

Line	ℓ_0	ℓ_4	ℓ_{29}
in point	P_{12}	P_{77889}	P_{77889}

Line 12 intersects

Line	ℓ_0	ℓ_4	ℓ_{16}
in point	P_{13}	P_{20545}	P_{20545}

Line 13 intersects

Line	ℓ_0	ℓ_4	ℓ_{39}
in point	P_{14}	P_{192577}	P_{192577}

Line 14 intersects

Line	ℓ_0	ℓ_4	ℓ_{49}
in point	P_{15}	P_{155713}	P_{155713}

Line 15 intersects

Line	ℓ_0	ℓ_4	ℓ_{30}
in point	P_{16}	P_{98369}	P_{98369}

Line 16 intersects

Line	ℓ_0	ℓ_4	ℓ_{12}
in point	P_{17}	P_{20545}	P_{20545}

Line 17 intersects

Line	ℓ_0	ℓ_4	ℓ_{23}
in point	P_{18}	P_{110657}	P_{110657}

Line 18 intersects

Line	ℓ_0	ℓ_4	ℓ_{42}
in point	P_{19}	P_{168001}	P_{168001}

Line 19 intersects

Line	ℓ_0	ℓ_4	ℓ_{48}
in point	P_{20}	P_{254017}	P_{254017}

Line 20 intersects

Line	ℓ_0	ℓ_4	ℓ_{10}
in point	P_{21}	P_{94273}	P_{94273}

Line 21 intersects

Line	ℓ_0	ℓ_4	ℓ_{32}
in point	P_{22}	P_{65601}	P_{65601}

Line 22 intersects

Line	ℓ_0	ℓ_4	ℓ_{63}
in point	P_{23}	P_{196673}	P_{196673}

Line 23 intersects

Line	ℓ_0	ℓ_4	ℓ_{17}
in point	P_{24}	P_{110657}	P_{110657}

Line 24 intersects

Line	ℓ_0	ℓ_4	ℓ_{41}
in point	P_{25}	P_{213057}	P_{213057}

Line 25 intersects

Line	ℓ_0	ℓ_4	ℓ_{43}
in point	P_{26}	P_{258113}	P_{258113}

Line 26 intersects

Line	ℓ_0	ℓ_4	ℓ_{38}
in point	P_{27}	P_{217153}	P_{217153}

Line 27 intersects

Line	ℓ_0	ℓ_4	ℓ_{66}
in point	P_{28}	P_{163905}	P_{163905}

Line 28 intersects

Line	ℓ_0	ℓ_4	ℓ_8
in point	P_{29}	P_{118849}	P_{118849}

Line 29 intersects

Line	ℓ_0	ℓ_4	ℓ_{11}
in point	P_{30}	P_{77889}	P_{77889}

Line 30 intersects

Line	ℓ_0	ℓ_4	ℓ_{15}
in point	P_{31}	P_{98369}	P_{98369}

Line 31 intersects

Line	ℓ_0	ℓ_4	ℓ_{64}
in point	P_{32}	P_{139329}	P_{139329}

Line 32 intersects

Line	ℓ_0	ℓ_4	ℓ_{21}
in point	P_{33}	P_{65601}	P_{65601}

Line 33 intersects

Line	ℓ_0	ℓ_4	ℓ_{54}
in point	P_{34}	P_{188481}	P_{188481}

Line 34 intersects

Line	ℓ_0	ℓ_4	ℓ_{62}
in point	P_{35}	P_{151617}	P_{151617}

Line 35 intersects

Line	ℓ_0	ℓ_4	ℓ_{51}
in point	P_{36}	P_{69697}	P_{69697}

Line 36 intersects

Line	ℓ_0	ℓ_4	ℓ_5
in point	P_{37}	P_{147521}	P_{147521}

Line 37 intersects

Line	ℓ_0	ℓ_4	ℓ_{44}
in point	P_{38}	P_{49217}	P_{49217}

Line 38 intersects

Line	ℓ_0	ℓ_4	ℓ_{26}
in point	P_{39}	P_{217153}	P_{217153}

Line 39 intersects

Line	ℓ_0	ℓ_4	ℓ_{13}
in point	P_{40}	P_{192577}	P_{192577}

Line 40 intersects

Line	ℓ_0	ℓ_4	ℓ_{50}
in point	P_{41}	P_{45121}	P_{45121}

Line 41 intersects

Line	ℓ_0	ℓ_4	ℓ_{24}
in point	P_{42}	P_{213057}	P_{213057}

Line 42 intersects

Line	ℓ_0	ℓ_4	ℓ_{18}
in point	P_{43}	P_{168001}	P_{168001}

Line 43 intersects

Line	ℓ_0	ℓ_4	ℓ_{25}
in point	P_{44}	P_{258113}	P_{258113}

Line 44 intersects

Line	ℓ_0	ℓ_4	ℓ_{37}
in point	P_{45}	P_{49217}	P_{49217}

Line 45 intersects

Line	ℓ_0	ℓ_4	ℓ_{55}
in point	P_{46}	P_{127041}	P_{127041}

Line 46 intersects

Line	ℓ_0	ℓ_4	ℓ_{57}
in point	P_{47}	P_{122945}	P_{122945}

Line 47 intersects

Line	ℓ_0	ℓ_4	ℓ_9
in point	P_{48}	P_{176193}	P_{176193}

Line 48 intersects

Line	ℓ_0	ℓ_4	ℓ_{19}
in point	P_{49}	P_{254017}	P_{254017}

Line 49 intersects

Line	ℓ_0	ℓ_4	ℓ_{14}
in point	P_{50}	P_{155713}	P_{155713}

Line 50 intersects

Line	ℓ_0	ℓ_4	ℓ_{40}
in point	P_{51}	P_{45121}	P_{45121}

Line 51 intersects

Line	ℓ_0	ℓ_4	ℓ_{35}
in point	P_{52}	P_{69697}	P_{69697}

Line 52 intersects

Line	ℓ_0	ℓ_4	ℓ_6
in point	P_{53}	P_{208961}	P_{208961}

Line 53 intersects

Line	ℓ_0	ℓ_4	ℓ_{61}
in point	P_{54}	P_{36929}	P_{36929}

Line 54 intersects

Line	ℓ_0	ℓ_4	ℓ_{33}
in point	P_{55}	P_{188481}	P_{188481}

Line 55 intersects

Line	ℓ_0	ℓ_4	ℓ_{45}
in point	P_{56}	P_{127041}	P_{127041}

Line 56 intersects

Line	ℓ_0	ℓ_4	ℓ_{58}
in point	P_{57}	P_{12353}	P_{12353}

Line 57 intersects

Line	ℓ_0	ℓ_4	ℓ_{46}
in point	P_{58}	P_{122945}	P_{122945}

Line 58 intersects

Line	ℓ_0	ℓ_4	ℓ_{56}
in point	P_{59}	P_{12353}	P_{12353}

Line 59 intersects

Line	ℓ_0	ℓ_4	ℓ_{60}
in point	P_{60}	P_{8258}	P_{8258}

Line 60 intersects

Line	ℓ_0	ℓ_4	ℓ_{59}
in point	P_{61}	P_{8258}	P_{8258}

Line 61 intersects

Line	ℓ_0	ℓ_4	ℓ_{53}
in point	P_{62}	P_{36929}	P_{36929}

Line 62 intersects

Line	ℓ_0	ℓ_4	ℓ_{34}
in point	P_{63}	P_{151617}	P_{151617}

Line 63 intersects

Line	ℓ_0	ℓ_4	ℓ_{22}
in point	P_{64}	P_{196673}	P_{196673}

Line 64 intersects

Line	ℓ_0	ℓ_4	ℓ_{31}
in point	P_{65}	P_{139329}	P_{139329}

Line 65 intersects

Line	ℓ_0	ℓ_4	ℓ_7
in point	P_{66}	P_{241729}	P_{241729}

Line 66 intersects

Line	ℓ_0	ℓ_4	ℓ_{27}
in point	P_{67}	P_{163905}	P_{163905}

The surface has 4225 points:
Too many to print.