Rank-74500 over GF(16)

January 15, 2021

The equation

The equation of the surface is :

$$X_0^3 + X_1^2X_2 + X_1^2X_3 + X_0X_3^2 + X_0X_1X_2 = 0$$

(1, 0, 0, 0, 0, 0, 0, 0, 1, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(16) is 286331158

General information

Number of lines	7
Number of points	305
Number of singular points	2
Number of Eckardt points	1
Number of double points	5
Number of single points	102
Number of points off lines	196
Number of Hesse planes	0
Number of axes	0
Type of points on lines	17^7
Type of lines on points	4, 3, 2^5, 1^{102}, 0^{196}

Singular Points

The surface has 2 singular points:

$0:\ P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$
$1:\ P_{275} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$

The 7 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{69889} = \left[\begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{array}\right]_{69889} = \mathbf{Pl}(0,0,0,1,0,1)_{5121}$$

$$\ell_1 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{70160} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{70160} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_2 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4624} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4624} = \mathbf{Pl}(0,1,1,0,0,0)_{18}$$

$$\ell_3 = \begin{bmatrix} 1 & 1 & 0 & \delta^5 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{48577} = \begin{bmatrix} 1 & 1 & 0 & 11 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{48577} = \mathbf{Pl}(0,11,1,0,0,1)_{4682}$$

$$\ell_4 = \begin{bmatrix} 1 & 1 & 0 & \delta^{10} \\ 0 & 0 & 1 & 0 \end{bmatrix}_{44209} = \begin{bmatrix} 1 & 1 & 0 & 10 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{44209} = \mathbf{Pl}(0,10,1,0,0,1)_{4681}$$

$$\ell_5 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^5 & \delta^5 \end{bmatrix}_{4555} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 11 & 11 \end{bmatrix}_{4555} = \mathbf{Pl}(1,1,1,10,1,0)_{3275}$$

$$\ell_6 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & \delta^{10} & \delta^{10} \end{bmatrix}_{4538} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 10 & 10 \end{bmatrix}_{4538} = \mathbf{Pl}(1,1,1,11,1,0)_{3500}$$

Rank of lines: (69889, 70160, 4624, 48577, 44209, 4555, 4538)
Rank of points on Klein quadric: (5121, 1, 18, 4682, 4681, 3275, 3500)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_{275} = \mathbf{P}(1,0,0,1) = \mathbf{P}(1,0,0,1)$.

Double Points

The surface has 5 Double points:
The double points on the surface are:

$P_{530} = (0,0,1,1) = \ell_0 \cap \ell_1$
$P_{689} = (0,10,1,1) = \ell_0 \cap \ell_5$
$P_{705} = (0,11,1,1) = \ell_0 \cap \ell_6$
$P_{3259} = (10,10,11,1) = \ell_3 \cap \ell_6$
$P_{3020} = (11,11,10,1) = \ell_4 \cap \ell_5$

Single Points

The surface has 102 single points:
The single points on the surface are:

$0 : P_1 = (0,1,0,0)$ lies on line ℓ_0
$1 : P_3 = (0,0,0,1)$ lies on line ℓ_1
$2 : P_{180} = (1,10,1,0)$ lies on line ℓ_5
$3 : P_{196} = (1,11,1,0)$ lies on line ℓ_6
$4 : P_{444} = (10,10,0,1)$ lies on line ℓ_3
$5 : P_{461} = (11,11,0,1)$ lies on line ℓ_4
$6 : P_{531} = (1,0,1,1)$ lies on line ℓ_2
$7 : P_{546} = (0,1,1,1)$ lies on line ℓ_0
$8 : P_{561} = (0,2,1,1)$ lies on line ℓ_0
$9 : P_{577} = (0,3,1,1)$ lies on line ℓ_0
$10 : P_{593} = (0,4,1,1)$ lies on line ℓ_0
$11 : P_{609} = (0,5,1,1)$ lies on line ℓ_0
$12 : P_{625} = (0,6,1,1)$ lies on line ℓ_0
$13 : P_{641} = (0,7,1,1)$ lies on line ℓ_0
$14 : P_{657} = (0,8,1,1)$ lies on line ℓ_0
$15 : P_{673} = (0,9,1,1)$ lies on line ℓ_0
$16 : P_{699} = (10,10,1,1)$ lies on line ℓ_3
$17 : P_{716} = (11,11,1,1)$ lies on line ℓ_4
$18 : P_{721} = (0,12,1,1)$ lies on line ℓ_0
$19 : P_{737} = (0,13,1,1)$ lies on line ℓ_0
$20 : P_{753} = (0,14,1,1)$ lies on line ℓ_0
$21 : P_{769} = (0,15,1,1)$ lies on line ℓ_0
$22 : P_{785} = (0,0,2,1)$ lies on line ℓ_1
$23 : P_{786} = (1,0,2,1)$ lies on line ℓ_2
$24 : P_{955} = (10,10,2,1)$ lies on line ℓ_3
$25 : P_{972} = (11,11,2,1)$ lies on line ℓ_4

26 : $P_{996} = (3, 13, 2, 1)$ lies on line ℓ_5
27 : $P_{1028} = (3, 15, 2, 1)$ lies on line ℓ_6
28 : $P_{1041} = (0, 0, 3, 1)$ lies on line ℓ_1
29 : $P_{1042} = (1, 0, 3, 1)$ lies on line ℓ_2
30 : $P_{1107} = (2, 4, 3, 1)$ lies on line ℓ_6
31 : $P_{1155} = (2, 7, 3, 1)$ lies on line ℓ_5
32 : $P_{1211} = (10, 10, 3, 1)$ lies on line ℓ_3
33 : $P_{1228} = (11, 11, 3, 1)$ lies on line ℓ_4
34 : $P_{1297} = (0, 0, 4, 1)$ lies on line ℓ_1
35 : $P_{1298} = (1, 0, 4, 1)$ lies on line ℓ_2
36 : $P_{1350} = (5, 3, 4, 1)$ lies on line ℓ_5
37 : $P_{1414} = (5, 7, 4, 1)$ lies on line ℓ_6
38 : $P_{1467} = (10, 10, 4, 1)$ lies on line ℓ_3
39 : $P_{1484} = (11, 11, 4, 1)$ lies on line ℓ_4
40 : $P_{1553} = (0, 0, 5, 1)$ lies on line ℓ_1
41 : $P_{1554} = (1, 0, 5, 1)$ lies on line ℓ_2
42 : $P_{1701} = (4, 9, 5, 1)$ lies on line ℓ_5
43 : $P_{1723} = (10, 10, 5, 1)$ lies on line ℓ_3
44 : $P_{1740} = (11, 11, 5, 1)$ lies on line ℓ_4
45 : $P_{1749} = (4, 12, 5, 1)$ lies on line ℓ_6
46 : $P_{1809} = (0, 0, 6, 1)$ lies on line ℓ_1
47 : $P_{1810} = (1, 0, 6, 1)$ lies on line ℓ_2
48 : $P_{1944} = (7, 8, 6, 1)$ lies on line ℓ_6
49 : $P_{1979} = (10, 10, 6, 1)$ lies on line ℓ_3
50 : $P_{1996} = (11, 11, 6, 1)$ lies on line ℓ_4
51 : $P_{2040} = (7, 14, 6, 1)$ lies on line ℓ_5
52 : $P_{2065} = (0, 0, 7, 1)$ lies on line ℓ_1
53 : $P_{2066} = (1, 0, 7, 1)$ lies on line ℓ_2
54 : $P_{2119} = (6, 3, 7, 1)$ lies on line ℓ_6
55 : $P_{2135} = (6, 4, 7, 1)$ lies on line ℓ_5
56 : $P_{2235} = (10, 10, 7, 1)$ lies on line ℓ_3
57 : $P_{2252} = (11, 11, 7, 1)$ lies on line ℓ_4
58 : $P_{2321} = (0, 0, 8, 1)$ lies on line ℓ_1
59 : $P_{2322} = (1, 0, 8, 1)$ lies on line ℓ_2
60 : $P_{2426} = (9, 6, 8, 1)$ lies on line ℓ_5
61 : $P_{2491} = (10, 10, 8, 1)$ lies on line ℓ_3
62 : $P_{2508} = (11, 11, 8, 1)$ lies on line ℓ_4
63 : $P_{2554} = (9, 14, 8, 1)$ lies on line ℓ_6
64 : $P_{2577} = (0, 0, 9, 1)$ lies on line ℓ_1
65 : $P_{2578} = (1, 0, 9, 1)$ lies on line ℓ_2
66 : $P_{2665} = (8, 5, 9, 1)$ lies on line ℓ_6
67 : $P_{2747} = (10, 10, 9, 1)$ lies on line ℓ_3
68 : $P_{2764} = (11, 11, 9, 1)$ lies on line ℓ_4
69 : $P_{2777} = (8, 12, 9, 1)$ lies on line ℓ_5
70 : $P_{2833} = (0, 0, 10, 1)$ lies on line ℓ_1
71 : $P_{2834} = (1, 0, 10, 1)$ lies on line ℓ_2
72 : $P_{2860} = (11, 1, 10, 1)$ lies on line ℓ_6
73 : $P_{3003} = (10, 10, 10, 1)$ lies on line ℓ_3
74 : $P_{3089} = (0, 0, 11, 1)$ lies on line ℓ_1
75 : $P_{3090} = (1, 0, 11, 1)$ lies on line ℓ_2
76 : $P_{3115} = (10, 1, 11, 1)$ lies on line ℓ_5
77 : $P_{3276} = (11, 11, 11, 1)$ lies on line ℓ_4
78 : $P_{3345} = (0, 0, 12, 1)$ lies on line ℓ_1
79 : $P_{3346} = (1, 0, 12, 1)$ lies on line ℓ_2
80 : $P_{3438} = (13, 5, 12, 1)$ lies on line ℓ_5
81 : $P_{3502} = (13, 9, 12, 1)$ lies on line ℓ_6
82 : $P_{3515} = (10, 10, 12, 1)$ lies on line ℓ_3
83 : $P_{3532} = (11, 11, 12, 1)$ lies on line ℓ_4
84 : $P_{3601} = (0, 0, 13, 1)$ lies on line ℓ_1
85 : $P_{3602} = (1, 0, 13, 1)$ lies on line ℓ_2
86 : $P_{3645} = (12, 2, 13, 1)$ lies on line ℓ_6
87 : $P_{3771} = (10, 10, 13, 1)$ lies on line ℓ_3
88 : $P_{3788} = (11, 11, 13, 1)$ lies on line ℓ_4
89 : $P_{3853} = (12, 15, 13, 1)$ lies on line ℓ_5
90 : $P_{3857} = (0, 0, 14, 1)$ lies on line ℓ_1
91 : $P_{3858} = (1, 0, 14, 1)$ lies on line ℓ_2
92 : $P_{3968} = (15, 6, 14, 1)$ lies on line ℓ_6
93 : $P_{4000} = (15, 8, 14, 1)$ lies on line ℓ_5
94 : $P_{4027} = (10, 10, 14, 1)$ lies on line ℓ_3
95 : $P_{4044} = (11, 11, 14, 1)$ lies on line ℓ_4
96 : $P_{4113} = (0, 0, 15, 1)$ lies on line ℓ_1
97 : $P_{4114} = (1, 0, 15, 1)$ lies on line ℓ_2
98 : $P_{4159} = (14, 2, 15, 1)$ lies on line ℓ_5
99 : $P_{4283} = (10, 10, 15, 1)$ lies on line ℓ_3
100 : $P_{4300} = (11, 11, 15, 1)$ lies on line ℓ_4
101 : $P_{4335} = (14, 13, 15, 1)$ lies on line ℓ_6

The single points on the surface are:

Points on surface but on no line

The surface has 196 points not on any line:
The points on the surface but not on lines are:

0 : $P_{78} = (11, 3, 1, 0)$
1 : $P_{109} = (10, 5, 1, 0)$
2 : $P_{128} = (13, 6, 1, 0)$
3 : $P_{143} = (12, 7, 1, 0)$
4 : $P_{158} = (11, 8, 1, 0)$
5 : $P_{185} = (6, 10, 1, 0)$
6 : $P_{186} = (7, 10, 1, 0)$
7 : $P_{207} = (12, 11, 1, 0)$
8 : $P_{208} = (13, 11, 1, 0)$
9 : $P_{217} = (6, 12, 1, 0)$

$10: P_{234} = (7, 13, 1, 0)$
$11: P_{269} = (10, 15, 1, 0)$
$12: P_{335} = (13, 3, 0, 1)$
$13: P_{361} = (7, 5, 0, 1)$
$14: P_{378} = (8, 6, 0, 1)$
$15: P_{389} = (3, 7, 0, 1)$
$16: P_{414} = (12, 8, 0, 1)$
$17: P_{438} = (4, 10, 0, 1)$
$18: P_{448} = (14, 10, 0, 1)$
$19: P_{452} = (2, 11, 0, 1)$
$20: P_{459} = (9, 11, 0, 1)$
$21: P_{471} = (5, 12, 0, 1)$
$22: P_{497} = (15, 13, 0, 1)$
$23: P_{520} = (6, 15, 0, 1)$
$24: P_{576} = (15, 2, 1, 1)$
$25: P_{591} = (14, 3, 1, 1)$
$26: P_{596} = (3, 4, 1, 1)$
$27: P_{611} = (2, 5, 1, 1)$
$28: P_{638} = (13, 6, 1, 1)$
$29: P_{653} = (12, 7, 1, 1)$
$30: P_{661} = (4, 8, 1, 1)$
$31: P_{678} = (5, 9, 1, 1)$
$32: P_{727} = (6, 12, 1, 1)$
$33: P_{744} = (7, 13, 1, 1)$
$34: P_{761} = (8, 14, 1, 1)$
$35: P_{778} = (9, 15, 1, 1)$
$36: P_{805} = (4, 1, 2, 1)$
$37: P_{841} = (8, 3, 2, 1)$
$38: P_{856} = (7, 4, 2, 1)$
$39: P_{857} = (8, 4, 2, 1)$
$40: P_{864} = (15, 4, 2, 1)$
$41: P_{891} = (10, 6, 2, 1)$
$42: P_{927} = (14, 8, 2, 1)$
$43: P_{930} = (1, 9, 2, 1)$
$44: P_{935} = (6, 9, 2, 1)$
$45: P_{936} = (7, 9, 2, 1)$
$46: P_{966} = (5, 11, 2, 1)$
$47: P_{975} = (14, 11, 2, 1)$
$48: P_{998} = (5, 13, 2, 1)$
$49: P_{999} = (6, 13, 2, 1)$
$50: P_{1013} = (4, 14, 2, 1)$
$51: P_{1020} = (11, 14, 2, 1)$
$52: P_{1024} = (15, 14, 2, 1)$
$53: P_{1069} = (12, 1, 3, 1)$
$54: P_{1096} = (7, 3, 3, 1)$
$55: P_{1131} = (10, 5, 3, 1)$
$56: P_{1151} = (14, 6, 3, 1)$
$57: P_{1196} = (11, 9, 3, 1)$
$58: P_{1224} = (7, 11, 3, 1)$
$59: P_{1229} = (12, 11, 3, 1)$
$60: P_{1250} = (1, 13, 3, 1)$
$61: P_{1295} = (14, 15, 3, 1)$
$62: P_{1322} = (9, 1, 4, 1)$
$63: P_{1332} = (3, 2, 4, 1)$
$64: P_{1338} = (9, 2, 4, 1)$
$65: P_{1339} = (10, 2, 4, 1)$
$66: P_{1392} = (15, 5, 4, 1)$
$67: P_{1417} = (8, 7, 4, 1)$
$68: P_{1422} = (13, 7, 4, 1)$
$69: P_{1444} = (3, 9, 4, 1)$
$70: P_{1453} = (12, 9, 4, 1)$
$71: P_{1456} = (15, 9, 4, 1)$
$72: P_{1459} = (2, 10, 4, 1)$
$73: P_{1465} = (8, 10, 4, 1)$
$74: P_{1516} = (11, 13, 4, 1)$
$75: P_{1522} = (1, 14, 4, 1)$
$76: P_{1533} = (12, 14, 4, 1)$
$77: P_{1534} = (13, 14, 4, 1)$
$78: P_{1539} = (2, 15, 4, 1)$
$79: P_{1575} = (6, 1, 5, 1)$
$80: P_{1603} = (2, 3, 5, 1)$
$81: P_{1645} = (12, 5, 5, 1)$
$82: P_{1666} = (1, 7, 5, 1)$
$83: P_{1692} = (11, 8, 5, 1)$
$84: P_{1719} = (6, 10, 5, 1)$
$85: P_{1725} = (12, 10, 5, 1)$
$86: P_{1763} = (2, 13, 5, 1)$
$87: P_{1787} = (10, 14, 5, 1)$
$88: P_{1903} = (14, 5, 6, 1)$
$89: P_{1916} = (11, 6, 6, 1)$
$90: P_{1930} = (9, 7, 6, 1)$
$91: P_{1947} = (10, 8, 6, 1)$
$92: P_{1950} = (13, 8, 6, 1)$
$93: P_{1967} = (14, 9, 6, 1)$
$94: P_{2014} = (13, 12, 6, 1)$
$95: P_{2026} = (9, 13, 6, 1)$
$96: P_{2050} = (1, 15, 6, 1)$
$97: P_{2101} = (4, 2, 7, 1)$
$98: P_{2123} = (10, 3, 7, 1)$
$99: P_{2125} = (12, 3, 7, 1)$
$100: P_{2146} = (1, 5, 7, 1)$
$101: P_{2163} = (2, 6, 7, 1)$
$102: P_{2188} = (11, 7, 7, 1)$
$103: P_{2259} = (2, 12, 7, 1)$
$104: P_{2285} = (12, 13, 7, 1)$
$105: P_{2309} = (4, 15, 7, 1)$
$106: P_{2350} = (13, 1, 8, 1)$
$107: P_{2364} = (11, 2, 8, 1)$
$108: P_{2405} = (4, 5, 8, 1)$
$109: P_{2437} = (4, 7, 8, 1)$
$110: P_{2455} = (6, 8, 8, 1)$
$111: P_{2503} = (6, 11, 8, 1)$
$112: P_{2510} = (13, 11, 8, 1)$
$113: P_{2514} = (1, 12, 8, 1)$
$114: P_{2571} = (10, 15, 8, 1)$
$115: P_{2607} = (14, 1, 9, 1)$
$116: P_{2610} = (1, 2, 9, 1)$
$117: P_{2615} = (6, 2, 9, 1)$

$118: P_{2616} = (7, 2, 9, 1)$
$119: P_{2629} = (4, 3, 9, 1)$
$120: P_{2646} = (5, 4, 9, 1)$
$121: P_{2652} = (11, 4, 9, 1)$
$122: P_{2655} = (14, 4, 9, 1)$
$123: P_{2699} = (10, 7, 9, 1)$
$124: P_{2708} = (3, 8, 9, 1)$
$125: P_{2757} = (4, 11, 9, 1)$
$126: P_{2768} = (15, 11, 9, 1)$
$127: P_{2776} = (7, 12, 9, 1)$
$128: P_{2784} = (15, 12, 9, 1)$
$129: P_{2804} = (3, 14, 9, 1)$
$130: P_{2806} = (5, 14, 9, 1)$
$131: P_{2807} = (6, 14, 9, 1)$
$132: P_{2852} = (3, 1, 10, 1)$
$133: P_{2857} = (8, 1, 10, 1)$
$134: P_{2916} = (3, 5, 10, 1)$
$135: P_{2934} = (5, 6, 10, 1)$
$136: P_{2960} = (15, 7, 10, 1)$
$137: P_{2998} = (5, 10, 10, 1)$
$138: P_{3008} = (15, 10, 10, 1)$
$139: P_{3010} = (1, 11, 10, 1)$
$140: P_{3019} = (10, 11, 10, 1)$
$141: P_{3081} = (8, 15, 10, 1)$
$142: P_{3110} = (5, 1, 11, 1)$
$143: P_{3120} = (15, 1, 11, 1)$
$144: P_{3152} = (15, 3, 11, 1)$
$145: P_{3222} = (5, 8, 11, 1)$
$146: P_{3250} = (1, 10, 11, 1)$
$147: P_{3260} = (11, 10, 11, 1)$
$148: P_{3268} = (3, 11, 11, 1)$
$149: P_{3273} = (8, 11, 11, 1)$
$150: P_{3284} = (3, 12, 11, 1)$
$151: P_{3305} = (8, 13, 11, 1)$
$152: P_{3402} = (9, 3, 12, 1)$
$153: P_{3418} = (9, 4, 12, 1)$
$154: P_{3431} = (6, 5, 12, 1)$
$155: P_{3436} = (11, 5, 12, 1)$
$156: P_{3445} = (4, 6, 12, 1)$
$157: P_{3463} = (6, 7, 12, 1)$
$158: P_{3474} = (1, 8, 12, 1)$
$159: P_{3547} = (10, 12, 12, 1)$
$160: P_{3557} = (4, 13, 12, 1)$
$161: P_{3650} = (1, 3, 13, 1)$
$162: P_{3704} = (7, 6, 13, 1)$
$163: P_{3727} = (14, 7, 13, 1)$
$164: P_{3731} = (2, 8, 13, 1)$
$165: P_{3807} = (14, 12, 13, 1)$
$166: P_{3819} = (10, 13, 13, 1)$
$167: P_{3827} = (2, 14, 13, 1)$
$168: P_{3848} = (7, 15, 13, 1)$
$169: P_{3852} = (11, 15, 13, 1)$
$170: P_{3875} = (2, 1, 14, 1)$
$171: P_{3894} = (5, 2, 14, 1)$
$172: P_{3897} = (8, 2, 14, 1)$
$173: P_{3902} = (13, 2, 14, 1)$
$174: P_{3922} = (1, 4, 14, 1)$
$175: P_{3933} = (12, 4, 14, 1)$
$176: P_{3934} = (13, 4, 14, 1)$
$177: P_{3946} = (9, 5, 14, 1)$
$178: P_{3956} = (3, 6, 14, 1)$
$179: P_{3965} = (12, 6, 14, 1)$
$180: P_{4003} = (2, 9, 14, 1)$
$181: P_{4009} = (8, 9, 14, 1)$
$182: P_{4011} = (10, 9, 14, 1)$
$183: P_{4020} = (3, 10, 14, 1)$
$184: P_{4026} = (9, 10, 14, 1)$
$185: P_{4060} = (11, 12, 14, 1)$
$186: P_{4102} = (5, 15, 14, 1)$
$187: P_{4136} = (7, 1, 15, 1)$
$188: P_{4172} = (11, 3, 15, 1)$
$189: P_{4187} = (10, 4, 15, 1)$
$190: P_{4210} = (1, 6, 15, 1)$
$191: P_{4250} = (9, 8, 15, 1)$
$192: P_{4280} = (7, 10, 15, 1)$
$193: P_{4286} = (13, 10, 15, 1)$
$194: P_{4314} = (9, 12, 15, 1)$
$195: P_{4366} = (13, 15, 15, 1)$

Line Intersection Graph

	0	1	2	3	4	5	6
0	0	1	0	0	0	1	1
1	1	0	1	1	1	0	0
2	0	1	0	1	1	1	1
3	0	1	1	0	1	0	1
4	0	1	1	1	0	1	0
5	1	0	1	0	1	0	1
6	1	0	1	1	0	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_5	ℓ_6
in point	P_{530}	P_{689}	P_{705}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4
in point	P_{530}	P_2	P_2	P_2

Line 2 intersects

Line	ℓ_1	ℓ_3	ℓ_4	ℓ_5	ℓ_6
in point	P_2	P_2	P_2	P_{275}	P_{275}

Line 3 intersects

Line	ℓ_1	ℓ_2	ℓ_4	ℓ_6
in point	P_2	P_2	P_2	P_{3259}

Line 4 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_5
in point	P_2	P_2	P_2	P_{3020}

Line 5 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_6
in point	P_{689}	P_{275}	P_{3020}	P_{275}

Line 6 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_5
in point	P_{705}	P_{275}	P_{3259}	P_{275}

The surface has 305 points:
The points on the surface are:

0 : $P_1 = (0, 1, 0, 0)$
1 : $P_2 = (0, 0, 1, 0)$
2 : $P_3 = (0, 0, 0, 1)$
3 : $P_{78} = (11, 3, 1, 0)$
4 : $P_{109} = (10, 5, 1, 0)$
5 : $P_{128} = (13, 6, 1, 0)$
6 : $P_{143} = (12, 7, 1, 0)$
7 : $P_{158} = (11, 8, 1, 0)$
8 : $P_{180} = (1, 10, 1, 0)$
9 : $P_{185} = (6, 10, 1, 0)$
10 : $P_{186} = (7, 10, 1, 0)$
11 : $P_{196} = (1, 11, 1, 0)$
12 : $P_{207} = (12, 11, 1, 0)$
13 : $P_{208} = (13, 11, 1, 0)$
14 : $P_{217} = (6, 12, 1, 0)$
15 : $P_{234} = (7, 13, 1, 0)$
16 : $P_{269} = (10, 15, 1, 0)$
17 : $P_{275} = (1, 0, 0, 1)$
18 : $P_{335} = (13, 3, 0, 1)$
19 : $P_{361} = (7, 5, 0, 1)$
20 : $P_{378} = (8, 6, 0, 1)$
21 : $P_{389} = (3, 7, 0, 1)$
22 : $P_{414} = (12, 8, 0, 1)$
23 : $P_{438} = (4, 10, 0, 1)$
24 : $P_{444} = (10, 10, 0, 1)$
25 : $P_{448} = (14, 10, 0, 1)$
26 : $P_{452} = (2, 11, 0, 1)$
27 : $P_{459} = (9, 11, 0, 1)$
28 : $P_{461} = (11, 11, 0, 1)$
29 : $P_{471} = (5, 12, 0, 1)$
30 : $P_{497} = (15, 13, 0, 1)$
31 : $P_{520} = (6, 15, 0, 1)$
32 : $P_{530} = (0, 0, 1, 1)$
33 : $P_{531} = (1, 0, 1, 1)$
34 : $P_{546} = (0, 1, 1, 1)$
35 : $P_{561} = (0, 2, 1, 1)$
36 : $P_{576} = (15, 2, 1, 1)$
37 : $P_{577} = (0, 3, 1, 1)$
38 : $P_{591} = (14, 3, 1, 1)$
39 : $P_{593} = (0, 4, 1, 1)$
40 : $P_{596} = (3, 4, 1, 1)$
41 : $P_{609} = (0, 5, 1, 1)$
42 : $P_{611} = (2, 5, 1, 1)$
43 : $P_{625} = (0, 6, 1, 1)$
44 : $P_{638} = (13, 6, 1, 1)$
45 : $P_{641} = (0, 7, 1, 1)$
46 : $P_{653} = (12, 7, 1, 1)$
47 : $P_{657} = (0, 8, 1, 1)$
48 : $P_{661} = (4, 8, 1, 1)$
49 : $P_{673} = (0, 9, 1, 1)$
50 : $P_{678} = (5, 9, 1, 1)$
51 : $P_{689} = (0, 10, 1, 1)$
52 : $P_{699} = (10, 10, 1, 1)$
53 : $P_{705} = (0, 11, 1, 1)$
54 : $P_{716} = (11, 11, 1, 1)$
55 : $P_{721} = (0, 12, 1, 1)$
56 : $P_{727} = (6, 12, 1, 1)$
57 : $P_{737} = (0, 13, 1, 1)$
58 : $P_{744} = (7, 13, 1, 1)$
59 : $P_{753} = (0, 14, 1, 1)$
60 : $P_{761} = (8, 14, 1, 1)$
61 : $P_{769} = (0, 15, 1, 1)$
62 : $P_{778} = (9, 15, 1, 1)$
63 : $P_{785} = (0, 0, 2, 1)$
64 : $P_{786} = (1, 0, 2, 1)$
65 : $P_{805} = (4, 1, 2, 1)$
66 : $P_{841} = (8, 3, 2, 1)$
67 : $P_{856} = (7, 4, 2, 1)$
68 : $P_{857} = (8, 4, 2, 1)$
69 : $P_{864} = (15, 4, 2, 1)$
70 : $P_{891} = (10, 6, 2, 1)$
71 : $P_{927} = (14, 8, 2, 1)$
72 : $P_{930} = (1, 9, 2, 1)$
73 : $P_{935} = (6, 9, 2, 1)$
74 : $P_{936} = (7, 9, 2, 1)$

$75: P_{955} = (10, 10, 2, 1)$
$76: P_{966} = (5, 11, 2, 1)$
$77: P_{972} = (11, 11, 2, 1)$
$78: P_{975} = (14, 11, 2, 1)$
$79: P_{996} = (3, 13, 2, 1)$
$80: P_{998} = (5, 13, 2, 1)$
$81: P_{999} = (6, 13, 2, 1)$
$82: P_{1013} = (4, 14, 2, 1)$
$83: P_{1020} = (11, 14, 2, 1)$
$84: P_{1024} = (15, 14, 2, 1)$
$85: P_{1028} = (3, 15, 2, 1)$
$86: P_{1041} = (0, 0, 3, 1)$
$87: P_{1042} = (1, 0, 3, 1)$
$88: P_{1069} = (12, 1, 3, 1)$
$89: P_{1096} = (7, 3, 3, 1)$
$90: P_{1107} = (2, 4, 3, 1)$
$91: P_{1131} = (10, 5, 3, 1)$
$92: P_{1151} = (14, 6, 3, 1)$
$93: P_{1155} = (2, 7, 3, 1)$
$94: P_{1196} = (11, 9, 3, 1)$
$95: P_{1211} = (10, 10, 3, 1)$
$96: P_{1224} = (7, 11, 3, 1)$
$97: P_{1228} = (11, 11, 3, 1)$
$98: P_{1229} = (12, 11, 3, 1)$
$99: P_{1250} = (1, 13, 3, 1)$
$100: P_{1295} = (14, 15, 3, 1)$
$101: P_{1297} = (0, 0, 4, 1)$
$102: P_{1298} = (1, 0, 4, 1)$
$103: P_{1322} = (9, 1, 4, 1)$
$104: P_{1332} = (3, 2, 4, 1)$
$105: P_{1338} = (9, 2, 4, 1)$
$106: P_{1339} = (10, 2, 4, 1)$
$107: P_{1350} = (5, 3, 4, 1)$
$108: P_{1392} = (15, 5, 4, 1)$
$109: P_{1414} = (5, 7, 4, 1)$
$110: P_{1417} = (8, 7, 4, 1)$
$111: P_{1422} = (13, 7, 4, 1)$
$112: P_{1444} = (3, 9, 4, 1)$
$113: P_{1453} = (12, 9, 4, 1)$
$114: P_{1456} = (15, 9, 4, 1)$
$115: P_{1459} = (2, 10, 4, 1)$
$116: P_{1465} = (8, 10, 4, 1)$
$117: P_{1467} = (10, 10, 4, 1)$
$118: P_{1484} = (11, 11, 4, 1)$
$119: P_{1516} = (11, 13, 4, 1)$
$120: P_{1522} = (1, 14, 4, 1)$
$121: P_{1533} = (12, 14, 4, 1)$
$122: P_{1534} = (13, 14, 4, 1)$
$123: P_{1539} = (2, 15, 4, 1)$
$124: P_{1553} = (0, 0, 5, 1)$
$125: P_{1554} = (1, 0, 5, 1)$
$126: P_{1575} = (6, 1, 5, 1)$
$127: P_{1603} = (2, 3, 5, 1)$
$128: P_{1645} = (12, 5, 5, 1)$
$129: P_{1666} = (1, 7, 5, 1)$
$130: P_{1692} = (11, 8, 5, 1)$
$131: P_{1701} = (4, 9, 5, 1)$
$132: P_{1719} = (6, 10, 5, 1)$
$133: P_{1723} = (10, 10, 5, 1)$
$134: P_{1725} = (12, 10, 5, 1)$
$135: P_{1740} = (11, 11, 5, 1)$
$136: P_{1749} = (4, 12, 5, 1)$
$137: P_{1763} = (2, 13, 5, 1)$
$138: P_{1787} = (10, 14, 5, 1)$
$139: P_{1809} = (0, 0, 6, 1)$
$140: P_{1810} = (1, 0, 6, 1)$
$141: P_{1903} = (14, 5, 6, 1)$
$142: P_{1916} = (11, 6, 6, 1)$
$143: P_{1930} = (9, 7, 6, 1)$
$144: P_{1944} = (7, 8, 6, 1)$
$145: P_{1947} = (10, 8, 6, 1)$
$146: P_{1950} = (13, 8, 6, 1)$
$147: P_{1967} = (14, 9, 6, 1)$
$148: P_{1979} = (10, 10, 6, 1)$
$149: P_{1996} = (11, 11, 6, 1)$
$150: P_{2014} = (13, 12, 6, 1)$
$151: P_{2026} = (9, 13, 6, 1)$
$152: P_{2040} = (7, 14, 6, 1)$
$153: P_{2050} = (1, 15, 6, 1)$
$154: P_{2065} = (0, 0, 7, 1)$
$155: P_{2066} = (1, 0, 7, 1)$
$156: P_{2101} = (4, 2, 7, 1)$
$157: P_{2119} = (6, 3, 7, 1)$
$158: P_{2123} = (10, 3, 7, 1)$
$159: P_{2125} = (12, 3, 7, 1)$
$160: P_{2135} = (6, 4, 7, 1)$
$161: P_{2146} = (1, 5, 7, 1)$
$162: P_{2163} = (2, 6, 7, 1)$
$163: P_{2188} = (11, 7, 7, 1)$
$164: P_{2235} = (10, 10, 7, 1)$
$165: P_{2252} = (11, 11, 7, 1)$
$166: P_{2259} = (2, 12, 7, 1)$
$167: P_{2285} = (12, 13, 7, 1)$
$168: P_{2309} = (4, 15, 7, 1)$
$169: P_{2321} = (0, 0, 8, 1)$
$170: P_{2322} = (1, 0, 8, 1)$
$171: P_{2350} = (13, 1, 8, 1)$
$172: P_{2364} = (11, 2, 8, 1)$
$173: P_{2405} = (4, 5, 8, 1)$
$174: P_{2426} = (9, 6, 8, 1)$
$175: P_{2437} = (4, 7, 8, 1)$
$176: P_{2455} = (6, 8, 8, 1)$
$177: P_{2491} = (10, 10, 8, 1)$
$178: P_{2503} = (6, 11, 8, 1)$
$179: P_{2508} = (11, 11, 8, 1)$
$180: P_{2510} = (13, 11, 8, 1)$
$181: P_{2514} = (1, 12, 8, 1)$
$182: P_{2554} = (9, 14, 8, 1)$
$183: P_{2571} = (10, 15, 8, 1)$
$184: P_{2577} = (0, 0, 9, 1)$
$185: P_{2578} = (1, 0, 9, 1)$
$186: P_{2607} = (14, 1, 9, 1)$
$187: P_{2610} = (1, 2, 9, 1)$
$188: P_{2615} = (6, 2, 9, 1)$
$189: P_{2616} = (7, 2, 9, 1)$
$190: P_{2629} = (4, 3, 9, 1)$
$191: P_{2646} = (5, 4, 9, 1)$
$192: P_{2652} = (11, 4, 9, 1)$
$193: P_{2655} = (14, 4, 9, 1)$
$194: P_{2665} = (8, 5, 9, 1)$
$195: P_{2699} = (10, 7, 9, 1)$
$196: P_{2708} = (3, 8, 9, 1)$
$197: P_{2747} = (10, 10, 9, 1)$
$198: P_{2757} = (4, 11, 9, 1)$
$199: P_{2764} = (11, 11, 9, 1)$
$200: P_{2768} = (15, 11, 9, 1)$
$201: P_{2776} = (7, 12, 9, 1)$
$202: P_{2777} = (8, 12, 9, 1)$
$203: P_{2784} = (15, 12, 9, 1)$
$204: P_{2804} = (3, 14, 9, 1)$
$205: P_{2806} = (5, 14, 9, 1)$
$206: P_{2807} = (6, 14, 9, 1)$
$207: P_{2833} = (0, 0, 10, 1)$
$208: P_{2834} = (1, 0, 10, 1)$
$209: P_{2852} = (3, 1, 10, 1)$
$210: P_{2857} = (8, 1, 10, 1)$
$211: P_{2860} = (11, 1, 10, 1)$
$212: P_{2916} = (3, 5, 10, 1)$
$213: P_{2934} = (5, 6, 10, 1)$
$214: P_{2960} = (15, 7, 10, 1)$
$215: P_{2998} = (5, 10, 10, 1)$
$216: P_{3003} = (10, 10, 10, 1)$
$217: P_{3008} = (15, 10, 10, 1)$
$218: P_{3010} = (1, 11, 10, 1)$
$219: P_{3019} = (10, 11, 10, 1)$
$220: P_{3020} = (11, 11, 10, 1)$
$221: P_{3081} = (8, 15, 10, 1)$
$222: P_{3089} = (0, 0, 11, 1)$
$223: P_{3090} = (1, 0, 11, 1)$
$224: P_{3110} = (5, 1, 11, 1)$
$225: P_{3115} = (10, 1, 11, 1)$
$226: P_{3120} = (15, 1, 11, 1)$
$227: P_{3152} = (15, 3, 11, 1)$
$228: P_{3222} = (5, 8, 11, 1)$
$229: P_{3250} = (1, 10, 11, 1)$
$230: P_{3259} = (10, 10, 11, 1)$
$231: P_{3260} = (11, 10, 11, 1)$
$232: P_{3268} = (3, 11, 11, 1)$
$233: P_{3273} = (8, 11, 11, 1)$
$234: P_{3276} = (11, 11, 11, 1)$
$235: P_{3284} = (3, 12, 11, 1)$
$236: P_{3305} = (8, 13, 11, 1)$

$237: P_{3345} = (0, 0, 12, 1)$
$238: P_{3346} = (1, 0, 12, 1)$
$239: P_{3402} = (9, 3, 12, 1)$
$240: P_{3418} = (9, 4, 12, 1)$
$241: P_{3431} = (6, 5, 12, 1)$
$242: P_{3436} = (11, 5, 12, 1)$
$243: P_{3438} = (13, 5, 12, 1)$
$244: P_{3445} = (4, 6, 12, 1)$
$245: P_{3463} = (6, 7, 12, 1)$
$246: P_{3474} = (1, 8, 12, 1)$
$247: P_{3502} = (13, 9, 12, 1)$
$248: P_{3515} = (10, 10, 12, 1)$
$249: P_{3532} = (11, 11, 12, 1)$
$250: P_{3547} = (10, 12, 12, 1)$
$251: P_{3557} = (4, 13, 12, 1)$
$252: P_{3601} = (0, 0, 13, 1)$
$253: P_{3602} = (1, 0, 13, 1)$
$254: P_{3645} = (12, 2, 13, 1)$
$255: P_{3650} = (1, 3, 13, 1)$
$256: P_{3704} = (7, 6, 13, 1)$
$257: P_{3727} = (14, 7, 13, 1)$
$258: P_{3731} = (2, 8, 13, 1)$
$259: P_{3771} = (10, 10, 13, 1)$
$260: P_{3788} = (11, 11, 13, 1)$
$261: P_{3807} = (14, 12, 13, 1)$
$262: P_{3819} = (10, 13, 13, 1)$
$263: P_{3827} = (2, 14, 13, 1)$
$264: P_{3848} = (7, 15, 13, 1)$
$265: P_{3852} = (11, 15, 13, 1)$
$266: P_{3853} = (12, 15, 13, 1)$
$267: P_{3857} = (0, 0, 14, 1)$
$268: P_{3858} = (1, 0, 14, 1)$
$269: P_{3875} = (2, 1, 14, 1)$
$270: P_{3894} = (5, 2, 14, 1)$
$271: P_{3897} = (8, 2, 14, 1)$
$272: P_{3902} = (13, 2, 14, 1)$
$273: P_{3922} = (1, 4, 14, 1)$
$274: P_{3933} = (12, 4, 14, 1)$
$275: P_{3934} = (13, 4, 14, 1)$
$276: P_{3946} = (9, 5, 14, 1)$
$277: P_{3956} = (3, 6, 14, 1)$
$278: P_{3965} = (12, 6, 14, 1)$
$279: P_{3968} = (15, 6, 14, 1)$
$280: P_{4000} = (15, 8, 14, 1)$
$281: P_{4003} = (2, 9, 14, 1)$
$282: P_{4009} = (8, 9, 14, 1)$
$283: P_{4011} = (10, 9, 14, 1)$
$284: P_{4020} = (3, 10, 14, 1)$
$285: P_{4026} = (9, 10, 14, 1)$
$286: P_{4027} = (10, 10, 14, 1)$
$287: P_{4044} = (11, 11, 14, 1)$
$288: P_{4060} = (11, 12, 14, 1)$
$289: P_{4102} = (5, 15, 14, 1)$
$290: P_{4113} = (0, 0, 15, 1)$
$291: P_{4114} = (1, 0, 15, 1)$
$292: P_{4136} = (7, 1, 15, 1)$
$293: P_{4159} = (14, 2, 15, 1)$
$294: P_{4172} = (11, 3, 15, 1)$
$295: P_{4187} = (10, 4, 15, 1)$
$296: P_{4210} = (1, 6, 15, 1)$
$297: P_{4250} = (9, 8, 15, 1)$
$298: P_{4280} = (7, 10, 15, 1)$
$299: P_{4283} = (10, 10, 15, 1)$
$300: P_{4286} = (13, 10, 15, 1)$
$301: P_{4300} = (11, 11, 15, 1)$
$302: P_{4314} = (9, 12, 15, 1)$
$303: P_{4335} = (14, 13, 15, 1)$
$304: P_{4366} = (13, 15, 15, 1)$