Rank-73987 over GF(32)

January 15, 2021

The equation

The equation of the surface is :

$$X_1^2X_2 + X_0X_3^2 + X_0X_1X_2 = 0$$

(0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is 1108378661

General information

Number of lines	5
Number of points	1089
Number of singular points	3
Number of Eckardt points	1
Number of double points	4
Number of single points	154
Number of points off lines	930
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33^5
Type of lines on points	3, 2^4, 1^{154}, 0^{930}

Singular Points

The surface has 3 singular points:

$0: \ P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0)$
$1: \ P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$
$2: \ P_5 = \mathbf{P}(1,1,0,0) = \mathbf{P}(1,1,0,0)$

The 5 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{1024} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_2 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{2081} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{2081} = \mathbf{Pl}(0,0,1,0,0,1)_{34912}$$

$$\ell_3 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1082400} = \mathbf{Pl}(0,0,0,1,0,0)_{65}$$

$$\ell_4 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{1083424} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

Rank of lines: (0, 1024, 2081, 1082400, 1083424)
Rank of points on Klein quadric: (0, 2, 34912, 65, 1)

Eckardt Points

The surface has 1 Eckardt points:
$0 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$.

Double Points

The surface has 4 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_5 = (1,1,0,0) = \ell_0 \cap \ell_2$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_3$
$P_3 = (0,0,0,1) = \ell_3 \cap \ell_4$

Single Points

The surface has 154 single points:
The single points on the surface are:

$0 : P_6 = (2,1,0,0)$ lies on line ℓ_0
$1 : P_7 = (3,1,0,0)$ lies on line ℓ_0
$2 : P_8 = (4,1,0,0)$ lies on line ℓ_0
$3 : P_9 = (5,1,0,0)$ lies on line ℓ_0
$4 : P_{10} = (6,1,0,0)$ lies on line ℓ_0
$5 : P_{11} = (7,1,0,0)$ lies on line ℓ_0
$6 : P_{12} = (8,1,0,0)$ lies on line ℓ_0
$7 : P_{13} = (9,1,0,0)$ lies on line ℓ_0
$8 : P_{14} = (10,1,0,0)$ lies on line ℓ_0
$9 : P_{15} = (11,1,0,0)$ lies on line ℓ_0
$10 : P_{16} = (12,1,0,0)$ lies on line ℓ_0
$11 : P_{17} = (13,1,0,0)$ lies on line ℓ_0
$12 : P_{18} = (14,1,0,0)$ lies on line ℓ_0
$13 : P_{19} = (15,1,0,0)$ lies on line ℓ_0
$14 : P_{20} = (16,1,0,0)$ lies on line ℓ_0
$15 : P_{21} = (17,1,0,0)$ lies on line ℓ_0
$16 : P_{22} = (18,1,0,0)$ lies on line ℓ_0
$17 : P_{23} = (19,1,0,0)$ lies on line ℓ_0
$18 : P_{24} = (20,1,0,0)$ lies on line ℓ_0
$19 : P_{25} = (21,1,0,0)$ lies on line ℓ_0
$20 : P_{26} = (22,1,0,0)$ lies on line ℓ_0
$21 : P_{27} = (23,1,0,0)$ lies on line ℓ_0
$22 : P_{28} = (24,1,0,0)$ lies on line ℓ_0
$23 : P_{29} = (25,1,0,0)$ lies on line ℓ_0
$24 : P_{30} = (26,1,0,0)$ lies on line ℓ_0
$25 : P_{31} = (27,1,0,0)$ lies on line ℓ_0
$26 : P_{32} = (28,1,0,0)$ lies on line ℓ_0
$27 : P_{33} = (29,1,0,0)$ lies on line ℓ_0
$28 : P_{34} = (30,1,0,0)$ lies on line ℓ_0
$29 : P_{35} = (31,1,0,0)$ lies on line ℓ_0
$30 : P_{36} = (1,0,1,0)$ lies on line ℓ_1
$31 : P_{37} = (2,0,1,0)$ lies on line ℓ_1
$32 : P_{38} = (3,0,1,0)$ lies on line ℓ_1
$33 : P_{39} = (4,0,1,0)$ lies on line ℓ_1
$34 : P_{40} = (5,0,1,0)$ lies on line ℓ_1
$35 : P_{41} = (6,0,1,0)$ lies on line ℓ_1

36 : $P_{42} = (7, 0, 1, 0)$ lies on line ℓ_1
37 : $P_{43} = (8, 0, 1, 0)$ lies on line ℓ_1
38 : $P_{44} = (9, 0, 1, 0)$ lies on line ℓ_1
39 : $P_{45} = (10, 0, 1, 0)$ lies on line ℓ_1
40 : $P_{46} = (11, 0, 1, 0)$ lies on line ℓ_1
41 : $P_{47} = (12, 0, 1, 0)$ lies on line ℓ_1
42 : $P_{48} = (13, 0, 1, 0)$ lies on line ℓ_1
43 : $P_{49} = (14, 0, 1, 0)$ lies on line ℓ_1
44 : $P_{50} = (15, 0, 1, 0)$ lies on line ℓ_1
45 : $P_{51} = (16, 0, 1, 0)$ lies on line ℓ_1
46 : $P_{52} = (17, 0, 1, 0)$ lies on line ℓ_1
47 : $P_{53} = (18, 0, 1, 0)$ lies on line ℓ_1
48 : $P_{54} = (19, 0, 1, 0)$ lies on line ℓ_1
49 : $P_{55} = (20, 0, 1, 0)$ lies on line ℓ_1
50 : $P_{56} = (21, 0, 1, 0)$ lies on line ℓ_1
51 : $P_{57} = (22, 0, 1, 0)$ lies on line ℓ_1
52 : $P_{58} = (23, 0, 1, 0)$ lies on line ℓ_1
53 : $P_{59} = (24, 0, 1, 0)$ lies on line ℓ_1
54 : $P_{60} = (25, 0, 1, 0)$ lies on line ℓ_1
55 : $P_{61} = (26, 0, 1, 0)$ lies on line ℓ_1
56 : $P_{62} = (27, 0, 1, 0)$ lies on line ℓ_1
57 : $P_{63} = (28, 0, 1, 0)$ lies on line ℓ_1
58 : $P_{64} = (29, 0, 1, 0)$ lies on line ℓ_1
59 : $P_{65} = (30, 0, 1, 0)$ lies on line ℓ_1
60 : $P_{66} = (31, 0, 1, 0)$ lies on line ℓ_1
61 : $P_{68} = (1, 1, 1, 0)$ lies on line ℓ_2
62 : $P_{101} = (2, 2, 1, 0)$ lies on line ℓ_2
63 : $P_{134} = (3, 3, 1, 0)$ lies on line ℓ_2
64 : $P_{167} = (4, 4, 1, 0)$ lies on line ℓ_2
65 : $P_{200} = (5, 5, 1, 0)$ lies on line ℓ_2
66 : $P_{233} = (6, 6, 1, 0)$ lies on line ℓ_2
67 : $P_{266} = (7, 7, 1, 0)$ lies on line ℓ_2
68 : $P_{299} = (8, 8, 1, 0)$ lies on line ℓ_2
69 : $P_{332} = (9, 9, 1, 0)$ lies on line ℓ_2
70 : $P_{365} = (10, 10, 1, 0)$ lies on line ℓ_2
71 : $P_{398} = (11, 11, 1, 0)$ lies on line ℓ_2
72 : $P_{431} = (12, 12, 1, 0)$ lies on line ℓ_2
73 : $P_{464} = (13, 13, 1, 0)$ lies on line ℓ_2
74 : $P_{497} = (14, 14, 1, 0)$ lies on line ℓ_2
75 : $P_{530} = (15, 15, 1, 0)$ lies on line ℓ_2
76 : $P_{563} = (16, 16, 1, 0)$ lies on line ℓ_2
77 : $P_{596} = (17, 17, 1, 0)$ lies on line ℓ_2
78 : $P_{629} = (18, 18, 1, 0)$ lies on line ℓ_2
79 : $P_{662} = (19, 19, 1, 0)$ lies on line ℓ_2
80 : $P_{695} = (20, 20, 1, 0)$ lies on line ℓ_2
81 : $P_{728} = (21, 21, 1, 0)$ lies on line ℓ_2
82 : $P_{761} = (22, 22, 1, 0)$ lies on line ℓ_2
83 : $P_{794} = (23, 23, 1, 0)$ lies on line ℓ_2
84 : $P_{827} = (24, 24, 1, 0)$ lies on line ℓ_2
85 : $P_{860} = (25, 25, 1, 0)$ lies on line ℓ_2
86 : $P_{893} = (26, 26, 1, 0)$ lies on line ℓ_2
87 : $P_{926} = (27, 27, 1, 0)$ lies on line ℓ_2
88 : $P_{959} = (28, 28, 1, 0)$ lies on line ℓ_2
89 : $P_{992} = (29, 29, 1, 0)$ lies on line ℓ_2
90 : $P_{1025} = (30, 30, 1, 0)$ lies on line ℓ_2
91 : $P_{1058} = (31, 31, 1, 0)$ lies on line ℓ_2
92 : $P_{1090} = (0, 1, 0, 1)$ lies on line ℓ_3
93 : $P_{1122} = (0, 2, 0, 1)$ lies on line ℓ_3
94 : $P_{1154} = (0, 3, 0, 1)$ lies on line ℓ_3
95 : $P_{1186} = (0, 4, 0, 1)$ lies on line ℓ_3
96 : $P_{1218} = (0, 5, 0, 1)$ lies on line ℓ_3
97 : $P_{1250} = (0, 6, 0, 1)$ lies on line ℓ_3
98 : $P_{1282} = (0, 7, 0, 1)$ lies on line ℓ_3
99 : $P_{1314} = (0, 8, 0, 1)$ lies on line ℓ_3
100 : $P_{1346} = (0, 9, 0, 1)$ lies on line ℓ_3
101 : $P_{1378} = (0, 10, 0, 1)$ lies on line ℓ_3
102 : $P_{1410} = (0, 11, 0, 1)$ lies on line ℓ_3
103 : $P_{1442} = (0, 12, 0, 1)$ lies on line ℓ_3
104 : $P_{1474} = (0, 13, 0, 1)$ lies on line ℓ_3
105 : $P_{1506} = (0, 14, 0, 1)$ lies on line ℓ_3
106 : $P_{1538} = (0, 15, 0, 1)$ lies on line ℓ_3
107 : $P_{1570} = (0, 16, 0, 1)$ lies on line ℓ_3
108 : $P_{1602} = (0, 17, 0, 1)$ lies on line ℓ_3
109 : $P_{1634} = (0, 18, 0, 1)$ lies on line ℓ_3
110 : $P_{1666} = (0, 19, 0, 1)$ lies on line ℓ_3
111 : $P_{1698} = (0, 20, 0, 1)$ lies on line ℓ_3
112 : $P_{1730} = (0, 21, 0, 1)$ lies on line ℓ_3
113 : $P_{1762} = (0, 22, 0, 1)$ lies on line ℓ_3
114 : $P_{1794} = (0, 23, 0, 1)$ lies on line ℓ_3
115 : $P_{1826} = (0, 24, 0, 1)$ lies on line ℓ_3
116 : $P_{1858} = (0, 25, 0, 1)$ lies on line ℓ_3
117 : $P_{1890} = (0, 26, 0, 1)$ lies on line ℓ_3
118 : $P_{1922} = (0, 27, 0, 1)$ lies on line ℓ_3
119 : $P_{1954} = (0, 28, 0, 1)$ lies on line ℓ_3
120 : $P_{1986} = (0, 29, 0, 1)$ lies on line ℓ_3
121 : $P_{2018} = (0, 30, 0, 1)$ lies on line ℓ_3
122 : $P_{2050} = (0, 31, 0, 1)$ lies on line ℓ_3
123 : $P_{2082} = (0, 0, 1, 1)$ lies on line ℓ_4
124 : $P_{3105} = (0, 0, 2, 1)$ lies on line ℓ_4
125 : $P_{4129} = (0, 0, 3, 1)$ lies on line ℓ_4
126 : $P_{5153} = (0, 0, 4, 1)$ lies on line ℓ_4
127 : $P_{6177} = (0, 0, 5, 1)$ lies on line ℓ_4
128 : $P_{7201} = (0, 0, 6, 1)$ lies on line ℓ_4
129 : $P_{8225} = (0, 0, 7, 1)$ lies on line ℓ_4
130 : $P_{9249} = (0, 0, 8, 1)$ lies on line ℓ_4
131 : $P_{10273} = (0, 0, 9, 1)$ lies on line ℓ_4
132 : $P_{11297} = (0, 0, 10, 1)$ lies on line ℓ_4
133 : $P_{12321} = (0, 0, 11, 1)$ lies on line ℓ_4
134 : $P_{13345} = (0, 0, 12, 1)$ lies on line ℓ_4
135 : $P_{14369} = (0, 0, 13, 1)$ lies on line ℓ_4
136 : $P_{15393} = (0, 0, 14, 1)$ lies on line ℓ_4
137 : $P_{16417} = (0, 0, 15, 1)$ lies on line ℓ_4
138 : $P_{17441} = (0, 0, 16, 1)$ lies on line ℓ_4
139 : $P_{18465} = (0, 0, 17, 1)$ lies on line ℓ_4
140 : $P_{19489} = (0, 0, 18, 1)$ lies on line ℓ_4
141 : $P_{20513} = (0, 0, 19, 1)$ lies on line ℓ_4
142 : $P_{21537} = (0, 0, 20, 1)$ lies on line ℓ_4
143 : $P_{22561} = (0, 0, 21, 1)$ lies on line ℓ_4

144 : $P_{23585} = (0, 0, 22, 1)$ lies on line ℓ_4
145 : $P_{24609} = (0, 0, 23, 1)$ lies on line ℓ_4
146 : $P_{25633} = (0, 0, 24, 1)$ lies on line ℓ_4
147 : $P_{26657} = (0, 0, 25, 1)$ lies on line ℓ_4
148 : $P_{27681} = (0, 0, 26, 1)$ lies on line ℓ_4
149 : $P_{28705} = (0, 0, 27, 1)$ lies on line ℓ_4
150 : $P_{29729} = (0, 0, 28, 1)$ lies on line ℓ_4
151 : $P_{30753} = (0, 0, 29, 1)$ lies on line ℓ_4
152 : $P_{31777} = (0, 0, 30, 1)$ lies on line ℓ_4
153 : $P_{32801} = (0, 0, 31, 1)$ lies on line ℓ_4

The single points on the surface are:

Points on surface but on no line

The surface has 930 points not on any line:
The points on the surface but not on lines are:

0 : $P_{2176} = (31, 2, 1, 1)$
1 : $P_{2193} = (16, 3, 1, 1)$
2 : $P_{2227} = (18, 4, 1, 1)$
3 : $P_{2254} = (13, 5, 1, 1)$
4 : $P_{2284} = (11, 6, 1, 1)$
5 : $P_{2313} = (8, 7, 1, 1)$
6 : $P_{2350} = (13, 8, 1, 1)$
7 : $P_{2399} = (30, 9, 1, 1)$
8 : $P_{2428} = (27, 10, 1, 1)$
9 : $P_{2452} = (19, 11, 1, 1)$
10 : $P_{2467} = (2, 12, 1, 1)$
11 : $P_{2508} = (11, 13, 1, 1)$
12 : $P_{2531} = (2, 14, 1, 1)$
13 : $P_{2569} = (8, 15, 1, 1)$
14 : $P_{2602} = (9, 16, 1, 1)$
15 : $P_{2652} = (27, 17, 1, 1)$
16 : $P_{2671} = (14, 18, 1, 1)$
17 : $P_{2705} = (16, 19, 1, 1)$
18 : $P_{2736} = (15, 20, 1, 1)$
19 : $P_{2763} = (10, 21, 1, 1)$
20 : $P_{2803} = (18, 22, 1, 1)$
21 : $P_{2847} = (30, 23, 1, 1)$
22 : $P_{2868} = (19, 24, 1, 1)$
23 : $P_{2890} = (9, 25, 1, 1)$
24 : $P_{2917} = (4, 26, 1, 1)$
25 : $P_{2960} = (15, 27, 1, 1)$
26 : $P_{2991} = (14, 28, 1, 1)$
27 : $P_{3040} = (31, 29, 1, 1)$
28 : $P_{3045} = (4, 30, 1, 1)$
29 : $P_{3083} = (10, 31, 1, 1)$
30 : $P_{3166} = (29, 1, 2, 1)$
31 : $P_{3178} = (9, 2, 2, 1)$
32 : $P_{3224} = (23, 3, 2, 1)$
33 : $P_{3253} = (20, 4, 2, 1)$
34 : $P_{3296} = (31, 5, 2, 1)$
35 : $P_{3298} = (1, 6, 2, 1)$
36 : $P_{3330} = (1, 7, 2, 1)$
37 : $P_{3383} = (22, 8, 2, 1)$
38 : $P_{3400} = (7, 9, 2, 1)$
39 : $P_{3446} = (21, 10, 2, 1)$
40 : $P_{3466} = (9, 11, 2, 1)$
41 : $P_{3516} = (27, 12, 2, 1)$
42 : $P_{3523} = (2, 13, 2, 1)$
43 : $P_{3560} = (7, 14, 2, 1)$
44 : $P_{3587} = (2, 15, 2, 1)$
45 : $P_{3637} = (20, 16, 2, 1)$
46 : $P_{3653} = (4, 17, 2, 1)$
47 : $P_{3721} = (8, 19, 2, 1)$
48 : $P_{3768} = (23, 20, 2, 1)$
49 : $P_{3781} = (4, 21, 2, 1)$
50 : $P_{3824} = (15, 22, 2, 1)$
51 : $P_{3868} = (27, 23, 2, 1)$
52 : $P_{3878} = (5, 24, 2, 1)$
53 : $P_{3920} = (15, 25, 2, 1)$
54 : $P_{3968} = (31, 26, 2, 1)$
55 : $P_{3977} = (8, 27, 2, 1)$
56 : $P_{4030} = (29, 28, 2, 1)$
57 : $P_{4038} = (5, 29, 2, 1)$
58 : $P_{4087} = (22, 30, 2, 1)$
59 : $P_{4118} = (21, 31, 2, 1)$
60 : $P_{4180} = (19, 1, 3, 1)$
61 : $P_{4219} = (26, 2, 3, 1)$
62 : $P_{4249} = (24, 3, 3, 1)$
63 : $P_{4286} = (29, 4, 3, 1)$
64 : $P_{4316} = (27, 5, 3, 1)$
65 : $P_{4330} = (9, 6, 3, 1)$
66 : $P_{4363} = (10, 7, 3, 1)$
67 : $P_{4403} = (18, 8, 3, 1)$
68 : $P_{4422} = (5, 9, 3, 1)$
69 : $P_{4480} = (31, 10, 3, 1)$
70 : $P_{4503} = (22, 11, 3, 1)$
71 : $P_{4518} = (5, 12, 3, 1)$
72 : $P_{4555} = (10, 13, 3, 1)$
73 : $P_{4602} = (25, 14, 3, 1)$
74 : $P_{4618} = (9, 15, 3, 1)$
75 : $P_{4647} = (6, 16, 3, 1)$

$76: P_{4687} = (14, 17, 3, 1)$
$77: P_{4724} = (19, 18, 3, 1)$
$78: P_{4744} = (7, 19, 3, 1)$
$79: P_{4776} = (7, 20, 3, 1)$
$80: P_{4832} = (31, 21, 3, 1)$
$81: P_{4839} = (6, 22, 3, 1)$
$82: P_{4890} = (25, 23, 3, 1)$
$83: P_{4923} = (26, 24, 3, 1)$
$84: P_{4958} = (29, 25, 3, 1)$
$85: P_{4979} = (18, 26, 3, 1)$
$86: P_{5017} = (24, 27, 3, 1)$
$87: P_{5079} = (22, 29, 3, 1)$
$88: P_{5116} = (27, 30, 3, 1)$
$89: P_{5135} = (14, 31, 3, 1)$
$90: P_{5207} = (22, 1, 4, 1)$
$91: P_{5227} = (10, 2, 4, 1)$
$92: P_{5267} = (18, 3, 4, 1)$
$93: P_{5292} = (11, 4, 4, 1)$
$94: P_{5337} = (24, 5, 4, 1)$
$95: P_{5376} = (31, 6, 4, 1)$
$96: P_{5394} = (17, 7, 4, 1)$
$97: P_{5419} = (10, 8, 4, 1)$
$98: P_{5498} = (25, 10, 4, 1)$
$99: P_{5526} = (21, 11, 4, 1)$
$100: P_{5553} = (16, 12, 4, 1)$
$101: P_{5598} = (29, 13, 4, 1)$
$102: P_{5629} = (28, 14, 4, 1)$
$103: P_{5644} = (11, 15, 4, 1)$
$104: P_{5694} = (29, 16, 4, 1)$
$105: P_{5715} = (18, 17, 4, 1)$
$106: P_{5757} = (28, 18, 4, 1)$
$107: P_{5786} = (25, 19, 4, 1)$
$108: P_{5794} = (1, 20, 4, 1)$
$109: P_{5826} = (1, 21, 4, 1)$
$110: P_{5874} = (17, 22, 4, 1)$
$111: P_{5911} = (22, 23, 4, 1)$
$112: P_{5923} = (2, 24, 4, 1)$
$113: P_{5984} = (31, 25, 4, 1)$
$114: P_{5987} = (2, 26, 4, 1)$
$115: P_{6021} = (4, 27, 4, 1)$
$116: P_{6065} = (16, 28, 4, 1)$
$117: P_{6105} = (24, 29, 4, 1)$
$118: P_{6134} = (21, 30, 4, 1)$
$119: P_{6149} = (4, 31, 4, 1)$
$120: P_{6217} = (8, 1, 5, 1)$
$121: P_{6248} = (7, 2, 5, 1)$
$122: P_{6282} = (9, 3, 5, 1)$
$123: P_{6308} = (3, 4, 5, 1)$
$124: P_{6344} = (7, 5, 5, 1)$
$125: P_{6391} = (22, 6, 5, 1)$
$126: P_{6404} = (3, 7, 5, 1)$
$127: P_{6454} = (21, 8, 5, 1)$
$128: P_{6473} = (8, 9, 5, 1)$
$129: P_{6506} = (9, 10, 5, 1)$
$130: P_{6546} = (17, 11, 5, 1)$
$131: P_{6591} = (30, 12, 5, 1)$
$132: P_{6613} = (20, 13, 5, 1)$
$133: P_{6643} = (18, 14, 5, 1)$
$134: P_{6682} = (25, 15, 5, 1)$
$135: P_{6711} = (22, 16, 5, 1)$
$136: P_{6723} = (2, 17, 5, 1)$
$137: P_{6783} = (30, 18, 5, 1)$
$138: P_{6787} = (2, 19, 5, 1)$
$139: P_{6828} = (11, 20, 5, 1)$
$140: P_{6863} = (14, 21, 5, 1)$
$141: P_{6906} = (25, 22, 5, 1)$
$142: P_{6951} = (6, 24, 5, 1)$
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$648: P_{24227} = (2, 20, 22, 1)$
$649: P_{24275} = (18, 21, 22, 1)$
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$656: P_{24487} = (6, 28, 22, 1)$
$657: P_{24523} = (10, 29, 22, 1)$
$658: P_{24557} = (12, 30, 22, 1)$
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$685: P_{25486} = (13, 27, 23, 1)$
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$695: P_{25839} = (14, 6, 24, 1)$
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$699: P_{25964} = (11, 10, 24, 1)$
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$703: P_{26107} = (26, 14, 24, 1)$
$704: P_{26134} = (21, 15, 24, 1)$
$705: P_{26158} = (13, 16, 24, 1)$
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$707: P_{26245} = (4, 19, 24, 1)$
$708: P_{26299} = (26, 20, 24, 1)$
$709: P_{26312} = (7, 21, 24, 1)$
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$711: P_{26373} = (4, 23, 24, 1)$
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$713: P_{26460} = (27, 25, 24, 1)$
$714: P_{26486} = (21, 26, 24, 1)$
$715: P_{26520} = (23, 27, 24, 1)$
$716: P_{26532} = (3, 28, 24, 1)$
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$719: P_{26628} = (3, 31, 24, 1)$
$720: P_{26705} = (16, 1, 25, 1)$
$721: P_{26739} = (18, 2, 25, 1)$
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$723: P_{26800} = (15, 4, 25, 1)$

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$727: P_{26918} = (5, 8, 25, 1)$
$728: P_{26971} = (26, 9, 25, 1)$
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$737: P_{27291} = (26, 19, 25, 1)$
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$746: P_{27562} = (9, 28, 25, 1)$
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$763: P_{28142} = (13, 14, 26, 1)$
$764: P_{28171} = (10, 15, 26, 1)$
$765: P_{28201} = (8, 16, 26, 1)$
$766: P_{28228} = (3, 17, 26, 1)$
$767: P_{28260} = (3, 18, 26, 1)$
$768: P_{28320} = (31, 19, 26, 1)$
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$770: P_{28405} = (20, 22, 26, 1)$
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$774: P_{28536} = (23, 26, 26, 1)$
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$776: P_{28599} = (22, 28, 26, 1)$
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$778: P_{28665} = (24, 30, 26, 1)$
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$783: P_{28839} = (6, 4, 27, 1)$
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$794: P_{29192} = (7, 15, 27, 1)$
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$802: P_{29444} = (3, 23, 27, 1)$
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$806: P_{29587} = (18, 27, 27, 1)$
$807: P_{29614} = (13, 28, 27, 1)$
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$818: P_{30078} = (29, 10, 28, 1)$
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$820: P_{30132} = (19, 12, 28, 1)$
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$822: P_{30204} = (27, 14, 28, 1)$
$823: P_{30232} = (23, 15, 28, 1)$
$824: P_{30262} = (21, 16, 28, 1)$
$825: P_{30297} = (24, 17, 28, 1)$
$826: P_{30311} = (6, 18, 28, 1)$
$827: P_{30355} = (18, 19, 28, 1)$
$828: P_{30375} = (6, 20, 28, 1)$
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$831: P_{30494} = (29, 23, 28, 1)$

832 : $P_{30520} = (23, 24, 28, 1)$
833 : $P_{30546} = (17, 25, 28, 1)$
834 : $P_{30591} = (30, 26, 28, 1)$
835 : $P_{30600} = (7, 27, 28, 1)$
836 : $P_{30632} = (7, 28, 28, 1)$
837 : $P_{30673} = (16, 29, 28, 1)$
838 : $P_{30697} = (8, 30, 28, 1)$
839 : $P_{30740} = (19, 31, 28, 1)$
840 : $P_{30787} = (2, 1, 29, 1)$
841 : $P_{30832} = (15, 2, 29, 1)$
842 : $P_{30851} = (2, 3, 29, 1)$
843 : $P_{30907} = (26, 4, 29, 1)$
844 : $P_{30941} = (28, 5, 29, 1)$
845 : $P_{30972} = (27, 6, 29, 1)$
846 : $P_{31008} = (31, 7, 29, 1)$
847 : $P_{31033} = (24, 8, 29, 1)$
848 : $P_{31044} = (3, 9, 29, 1)$
849 : $P_{31076} = (3, 10, 29, 1)$
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851 : $P_{31162} = (25, 12, 29, 1)$
852 : $P_{31184} = (15, 13, 29, 1)$
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855 : $P_{31289} = (24, 16, 29, 1)$
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859 : $P_{31450} = (25, 21, 29, 1)$
860 : $P_{31469} = (12, 22, 29, 1)$
861 : $P_{31495} = (6, 23, 29, 1)$
862 : $P_{31552} = (31, 24, 29, 1)$
863 : $P_{31581} = (28, 25, 29, 1)$
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868 : $P_{31739} = (26, 30, 29, 1)$
869 : $P_{31762} = (17, 31, 29, 1)$
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871 : $P_{31846} = (5, 2, 30, 1)$
872 : $P_{31890} = (17, 3, 30, 1)$
873 : $P_{31906} = (1, 4, 30, 1)$
874 : $P_{31938} = (1, 5, 30, 1)$
875 : $P_{31982} = (13, 6, 30, 1)$
876 : $P_{32006} = (5, 7, 30, 1)$
877 : $P_{32063} = (30, 8, 30, 1)$
878 : $P_{32093} = (28, 9, 30, 1)$
879 : $P_{32103} = (6, 10, 30, 1)$
880 : $P_{32142} = (13, 11, 30, 1)$
881 : $P_{32167} = (6, 12, 30, 1)$
882 : $P_{32214} = (21, 13, 30, 1)$
883 : $P_{32256} = (31, 14, 30, 1)$
884 : $P_{32275} = (18, 15, 30, 1)$
885 : $P_{32299} = (10, 16, 30, 1)$
886 : $P_{32352} = (31, 17, 30, 1)$
887 : $P_{32370} = (17, 18, 30, 1)$
888 : $P_{32400} = (15, 19, 30, 1)$
889 : $P_{32477} = (28, 21, 30, 1)$
890 : $P_{32511} = (30, 22, 30, 1)$
891 : $P_{32521} = (8, 23, 30, 1)$
892 : $P_{32566} = (21, 24, 30, 1)$
893 : $P_{32584} = (7, 25, 30, 1)$
894 : $P_{32619} = (10, 26, 30, 1)$
895 : $P_{32667} = (26, 27, 30, 1)$
896 : $P_{32688} = (15, 28, 30, 1)$
897 : $P_{32723} = (18, 29, 30, 1)$
898 : $P_{32744} = (7, 30, 30, 1)$
899 : $P_{32777} = (8, 31, 30, 1)$
900 : $P_{32854} = (21, 1, 31, 1)$
901 : $P_{32878} = (13, 2, 31, 1)$
902 : $P_{32928} = (31, 3, 31, 1)$
903 : $P_{32941} = (12, 4, 31, 1)$
904 : $P_{32980} = (19, 5, 31, 1)$
905 : $P_{33023} = (30, 6, 31, 1)$
906 : $P_{33051} = (26, 7, 31, 1)$
907 : $P_{33069} = (12, 8, 31, 1)$
908 : $P_{33111} = (22, 9, 31, 1)$
909 : $P_{33125} = (4, 10, 31, 1)$
910 : $P_{33159} = (6, 11, 31, 1)$
911 : $P_{33214} = (29, 12, 31, 1)$
912 : $P_{33223} = (6, 13, 31, 1)$
913 : $P_{33253} = (4, 14, 31, 1)$
914 : $P_{33294} = (13, 15, 31, 1)$
915 : $P_{33327} = (14, 16, 31, 1)$
916 : $P_{33374} = (29, 17, 31, 1)$
917 : $P_{33378} = (1, 18, 31, 1)$
918 : $P_{33410} = (1, 19, 31, 1)$
919 : $P_{33462} = (21, 20, 31, 1)$
920 : $P_{33475} = (2, 21, 31, 1)$
921 : $P_{33524} = (19, 22, 31, 1)$
922 : $P_{33539} = (2, 23, 31, 1)$
923 : $P_{33599} = (30, 24, 31, 1)$
924 : $P_{33604} = (3, 25, 31, 1)$
925 : $P_{33636} = (3, 26, 31, 1)$
926 : $P_{33728} = (31, 28, 31, 1)$
927 : $P_{33755} = (26, 29, 31, 1)$
928 : $P_{33775} = (14, 30, 31, 1)$
929 : $P_{33815} = (22, 31, 31, 1)$

Line Intersection Graph

	0 1 2 3 4
0	0 1 1 1 0
1	1 0 1 0 1
2	1 1 0 0 1
3	1 0 0 0 1
4	0 1 1 1 0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3
in point	P_0	P_5	P_1

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
in point	P_2	P_2	P_3

The surface has 1089 points:
Too many to print.