Rank-65859 over GF(16)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 0, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(16) is 303108373

General information

Number of lines	19
Number of points	289
Number of singular points	17
Number of Eckardt points	8
Number of double points	18
Number of single points	263
Number of points off lines	0
Number of Hesse planes	0
Number of axes	0
Type of points on lines	17^{19}
Type of lines on points	3^8, 2^{18}, 1^{263}

Singular Points

The surface has 17 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 : $P_{530} = \mathbf{P}(0,0,1,1) = \mathbf{P}(0,0,1,1)$
3 : $P_{785} = \mathbf{P}(0,0,\delta,1) = \mathbf{P}(0,0,2,1)$
4 : $P_{1041} = \mathbf{P}(0,0,\delta^{12},1) = \mathbf{P}(0,0,3,1)$
5 : $P_{1297} = \mathbf{P}(0,0,\delta^{2},1) = \mathbf{P}(0,0,4,1)$
6 : $P_{1553} = \mathbf{P}(0,0,\delta^{9},1) = \mathbf{P}(0,0,5,1)$
7 : $P_{1809} = \mathbf{P}(0,0,\delta^{13},1) = \mathbf{P}(0,0,6,1)$
8 : $P_{2065} = \mathbf{P}(0,0,\delta^{7},1) = \mathbf{P}(0,0,7,1)$
9 : $P_{2321} = \mathbf{P}(0,0,\delta^{3},1) = \mathbf{P}(0,0,8,1)$
10 : $P_{2577} = \mathbf{P}(0,0,\delta^{4},1) = \mathbf{P}(0,0,9,1)$
11 : $P_{2833} = \mathbf{P}(0,0,\delta^{10},1) = \mathbf{P}(0,0,10,1)$
12 : $P_{3089} = \mathbf{P}(0,0,\delta^{5},1) = \mathbf{P}(0,0,11,1)$
13 : $P_{3345} = \mathbf{P}(0,0,\delta^{14},1) = \mathbf{P}(0,0,12,1)$
14 : $P_{3601} = \mathbf{P}(0,0,\delta^{11},1) = \mathbf{P}(0,0,13,1)$
15 : $P_{3857} = \mathbf{P}(0,0,\delta^{8},1) = \mathbf{P}(0,0,14,1)$
16 : $P_{4113} = \mathbf{P}(0,0,\delta^{6},1) = \mathbf{P}(0,0,15,1)$

The 19 Lines

The lines and their Pluecker coordinates are:

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

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{256} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{256} = \mathbf{Pl}(0,0,1,0,0,0)_2$$

$$\ell_2 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{529} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{529} = \mathbf{Pl}(0,0,1,0,0,1)_{4656}$$

$$\ell_3 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{69904} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{69904} = \mathbf{Pl}(0,0,0,1,0,0)_{33}$$

$$\ell_4 = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{70160} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{70160} = \mathbf{Pl}(0,1,0,0,0,0)_1$$

$$\ell_5 = \begin{bmatrix} 1 & \delta^{14} & 0 & 0 \\ 0 & 0 & 1 & \delta^{10} \end{bmatrix}_{3542} = \begin{bmatrix} 1 & 12 & 0 & 0 \\ 0 & 0 & 1 & 10 \end{bmatrix}_{3542} = \mathbf{Pl}(0,0,11,10,13,1)_{58696}$$

$$\ell_6 = \begin{bmatrix} 1 & \delta^{3} & 0 & 0 \\ 0 & 0 & 1 & \delta^{7} \end{bmatrix}_{2447} = \begin{bmatrix} 1 & 8 & 0 & 0 \\ 0 & 0 & 1 & 7 \end{bmatrix}_{2447} = \mathbf{Pl}(0,0,14,7,9,1)_{42469}$$

$$\ell_7 = \begin{bmatrix} 1 & \delta^{13} & 0 & 0 \\ 0 & 0 & 1 & \delta^{5} \end{bmatrix}_{1905} = \begin{bmatrix} 1 & 6 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{1905} = \mathbf{Pl}(0,0,10,11,7,1)_{34185}$$

$$\ell_8 = \begin{bmatrix} 1 & \delta^{6} & 0 & 0 \\ 0 & 0 & 1 & \delta^{14} \end{bmatrix}_{4363} = \begin{bmatrix} 1 & 15 & 0 & 0 \\ 0 & 0 & 1 & 12 \end{bmatrix}_{4363} = \mathbf{Pl}(0,0,2,12,14,1)_{62497}$$

$$\ell_9 = \begin{bmatrix} 1 & \delta^{2} & 0 & 0 \\ 0 & 0 & 1 & \delta^{11} \end{bmatrix}_{1361} = \begin{bmatrix} 1 & 4 & 0 & 0 \\ 0 & 0 & 1 & 13 \end{bmatrix}_{1361} = \mathbf{Pl}(0,0,9,13,5,1)_{25994}$$

$$\ell_{10} = \begin{bmatrix} 1 & \delta^{8} & 0 & 0 \\ 0 & 0 & 1 & \delta^{14} \end{bmatrix}_{4090} = \begin{bmatrix} 1 & 14 & 0 & 0 \\ 0 & 0 & 1 & 12 \end{bmatrix}_{4090} = \mathbf{Pl}(0,0,2,12,15,1)_{66577}$$

$$\ell_{11} = \begin{bmatrix} 1 & \delta^{12} & 0 & 0 \\ 0 & 0 & 1 & \delta^{13} \end{bmatrix}_{1081} = \begin{bmatrix} 1 & 3 & 0 & 0 \\ 0 & 0 & 1 & 6 \end{bmatrix}_{1081} = \mathbf{Pl}(0,0,4,6,2,1)_{13599}$$

$$\ell_{12} = \begin{bmatrix} 1 & \delta^{11} & 0 & 0 \\ 0 & 0 & 1 & \delta^{10} \end{bmatrix}_{3815} = \begin{bmatrix} 1 & 13 & 0 & 0 \\ 0 & 0 & 1 & 10 \end{bmatrix}_{3815} = \mathbf{Pl}(0,0,11,10,12,1)_{54616}$$

$$\ell_{13} = \begin{bmatrix} 1 & \delta^{5} & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{3260} = \begin{bmatrix} 1 & 11 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{3260} = \mathbf{Pl}(0,0,1,1,10,1)_{46146}$$

$$\ell_{14} = \begin{bmatrix} 1 & \delta^{10} & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{2987} = \begin{bmatrix} 1 & 10 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{2987} = \mathbf{Pl}(0,0,1,1,11,1)_{50226}$$

$$\ell_{15} = \begin{bmatrix} 1 & \delta & 0 & 0 \\ 0 & 0 & 1 & \delta^{13} \end{bmatrix}_{808} = \begin{bmatrix} 1 & 2 & 0 & 0 \\ 0 & 0 & 1 & 6 \end{bmatrix}_{808} = \mathbf{Pl}(0,0,4,6,3,1)_{17679}$$

$$\ell_{16} = \begin{bmatrix} 1 & \delta^{4} & 0 & 0 \\ 0 & 0 & 1 & \delta^{7} \end{bmatrix}_{2720} = \begin{bmatrix} 1 & 9 & 0 & 0 \\ 0 & 0 & 1 & 7 \end{bmatrix}_{2720} = \mathbf{Pl}(0,0,14,7,8,1)_{38389}$$

$$\ell_{17} = \begin{bmatrix} 1 & \delta^{7} & 0 & 0 \\ 0 & 0 & 1 & \delta^{5} \end{bmatrix}_{2178} = \begin{bmatrix} 1 & 7 & 0 & 0 \\ 0 & 0 & 1 & 11 \end{bmatrix}_{2178} = \mathbf{Pl}(0,0,10,11,6,1)_{30105}$$

$$\ell_{18} = \begin{bmatrix} 1 & \delta^{9} & 0 & 0 \\ 0 & 0 & 1 & \delta^{11} \end{bmatrix}_{1634} = \begin{bmatrix} 1 & 5 & 0 & 0 \\ 0 & 0 & 1 & 13 \end{bmatrix}_{1634} = \mathbf{Pl}(0,0,9,13,4,1)_{21914}$$

Rank of lines: (0, 256, 529, 69904, 70160, 3542, 2447, 1905, 4363, 1361, 4090, 1081, 3815, 3260, 2987, 808, 2720, 2178, 1634)
Rank of points on Klein quadric: (0, 2, 4656, 33, 1, 58696, 42469, 34185, 62497, 25994, 66577, 13599, 54616, 46146, 50226, 17679, 38389, 30105, 21914)

Eckardt Points

The surface has 8 Eckardt points:
$0 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$,
$1 : P_{530} = \mathbf{P}(0,0,1,1) = \mathbf{P}(0,0,1,1)$,
$2 : P_{785} = \mathbf{P}(0,0,\delta,1) = \mathbf{P}(0,0,2,1)$,
$3 : P_{1297} = \mathbf{P}(0,0,\delta^2,1) = \mathbf{P}(0,0,4,1)$,
$4 : P_{2577} = \mathbf{P}(0,0,\delta^4,1) = \mathbf{P}(0,0,9,1)$,
$5 : P_{2833} = \mathbf{P}(0,0,\delta^{10},1) = \mathbf{P}(0,0,10,1)$,
$6 : P_{3089} = \mathbf{P}(0,0,\delta^5,1) = \mathbf{P}(0,0,11,1)$,
$7 : P_{3857} = \mathbf{P}(0,0,\delta^8,1) = \mathbf{P}(0,0,14,1)$.

Double Points

The surface has 18 Double points:
The double points on the surface are:

$P_0 = (1,0,0,0) = \ell_0 \cap \ell_1$
$P_5 = (1,1,0,0) = \ell_0 \cap \ell_2$
$P_1 = (0,1,0,0) = \ell_0 \cap \ell_3$
$P_6 = (2,1,0,0) = \ell_0 \cap \ell_5$
$P_7 = (3,1,0,0) = \ell_0 \cap \ell_6$
$P_8 = (4,1,0,0) = \ell_0 \cap \ell_7$
$P_9 = (5,1,0,0) = \ell_0 \cap \ell_8$
$P_{10} = (6,1,0,0) = \ell_0 \cap \ell_9$
$P_{11} = (7,1,0,0) = \ell_0 \cap \ell_{10}$
$P_{12} = (8,1,0,0) = \ell_0 \cap \ell_{11}$
$P_{13} = (9,1,0,0) = \ell_0 \cap \ell_{12}$
$P_{14} = (10,1,0,0) = \ell_0 \cap \ell_{13}$
$P_{15} = (11,1,0,0) = \ell_0 \cap \ell_{14}$
$P_{16} = (12,1,0,0) = \ell_0 \cap \ell_{15}$
$P_{17} = (13,1,0,0) = \ell_0 \cap \ell_{16}$
$P_{18} = (14,1,0,0) = \ell_0 \cap \ell_{17}$
$P_{19} = (15,1,0,0) = \ell_0 \cap \ell_{18}$
$P_3 = (0,0,0,1) = \ell_3 \cap \ell_4$

Single Points

The surface has 263 single points:
The single points on the surface are:

$0 :\ P_{20} = (1,0,1,0)$ lies on line ℓ_1
$1 :\ P_{21} = (2,0,1,0)$ lies on line ℓ_1
$2 :\ P_{22} = (3,0,1,0)$ lies on line ℓ_1
$3 :\ P_{23} = (4,0,1,0)$ lies on line ℓ_1
$4 :\ P_{24} = (5,0,1,0)$ lies on line ℓ_1
$5 :\ P_{25} = (6,0,1,0)$ lies on line ℓ_1
$6 :\ P_{26} = (7,0,1,0)$ lies on line ℓ_1
$7 :\ P_{27} = (8,0,1,0)$ lies on line ℓ_1
$8 :\ P_{28} = (9,0,1,0)$ lies on line ℓ_1
$9 :\ P_{29} = (10,0,1,0)$ lies on line ℓ_1
$10 :\ P_{30} = (11,0,1,0)$ lies on line ℓ_1
$11 :\ P_{31} = (12,0,1,0)$ lies on line ℓ_1
$12 :\ P_{32} = (13,0,1,0)$ lies on line ℓ_1
$13 :\ P_{33} = (14,0,1,0)$ lies on line ℓ_1
$14 :\ P_{34} = (15,0,1,0)$ lies on line ℓ_1
$15 :\ P_{36} = (1,1,1,0)$ lies on line ℓ_2
$16 :\ P_{53} = (2,2,1,0)$ lies on line ℓ_2
$17 :\ P_{70} = (3,3,1,0)$ lies on line ℓ_2
$18 :\ P_{87} = (4,4,1,0)$ lies on line ℓ_2
$19 :\ P_{104} = (5,5,1,0)$ lies on line ℓ_2
$20 :\ P_{121} = (6,6,1,0)$ lies on line ℓ_2
$21 :\ P_{138} = (7,7,1,0)$ lies on line ℓ_2
$22 :\ P_{155} = (8,8,1,0)$ lies on line ℓ_2
$23 :\ P_{172} = (9,9,1,0)$ lies on line ℓ_2
$24 :\ P_{189} = (10,10,1,0)$ lies on line ℓ_2
$25 :\ P_{206} = (11,11,1,0)$ lies on line ℓ_2
$26 :\ P_{223} = (12,12,1,0)$ lies on line ℓ_2
$27 :\ P_{240} = (13,13,1,0)$ lies on line ℓ_2
$28 :\ P_{257} = (14,14,1,0)$ lies on line ℓ_2
$29 :\ P_{274} = (15,15,1,0)$ lies on line ℓ_2
$30 :\ P_{290} = (0,1,0,1)$ lies on line ℓ_3
$31 :\ P_{306} = (0,2,0,1)$ lies on line ℓ_3
$32 :\ P_{322} = (0,3,0,1)$ lies on line ℓ_3
$33 :\ P_{338} = (0,4,0,1)$ lies on line ℓ_3
$34 :\ P_{354} = (0,5,0,1)$ lies on line ℓ_3
$35 :\ P_{370} = (0,6,0,1)$ lies on line ℓ_3
$36 :\ P_{386} = (0,7,0,1)$ lies on line ℓ_3
$37 :\ P_{402} = (0,8,0,1)$ lies on line ℓ_3

38 : $P_{418} = (0, 9, 0, 1)$ lies on line ℓ_3
39 : $P_{434} = (0, 10, 0, 1)$ lies on line ℓ_3
40 : $P_{450} = (0, 11, 0, 1)$ lies on line ℓ_3
41 : $P_{466} = (0, 12, 0, 1)$ lies on line ℓ_3
42 : $P_{482} = (0, 13, 0, 1)$ lies on line ℓ_3
43 : $P_{498} = (0, 14, 0, 1)$ lies on line ℓ_3
44 : $P_{514} = (0, 15, 0, 1)$ lies on line ℓ_3
45 : $P_{555} = (10, 1, 1, 1)$ lies on line ℓ_{13}
46 : $P_{556} = (11, 1, 1, 1)$ lies on line ℓ_{14}
47 : $P_{574} = (13, 2, 1, 1)$ lies on line ℓ_{13}
48 : $P_{576} = (15, 2, 1, 1)$ lies on line ℓ_{14}
49 : $P_{581} = (4, 3, 1, 1)$ lies on line ℓ_{14}
50 : $P_{584} = (7, 3, 1, 1)$ lies on line ℓ_{13}
51 : $P_{596} = (3, 4, 1, 1)$ lies on line ℓ_{13}
52 : $P_{600} = (7, 4, 1, 1)$ lies on line ℓ_{14}
53 : $P_{618} = (9, 5, 1, 1)$ lies on line ℓ_{13}
54 : $P_{621} = (12, 5, 1, 1)$ lies on line ℓ_{14}
55 : $P_{633} = (8, 6, 1, 1)$ lies on line ℓ_{14}
56 : $P_{639} = (14, 6, 1, 1)$ lies on line ℓ_{13}
57 : $P_{644} = (3, 7, 1, 1)$ lies on line ℓ_{14}
58 : $P_{645} = (4, 7, 1, 1)$ lies on line ℓ_{13}
59 : $P_{663} = (6, 8, 1, 1)$ lies on line ℓ_{13}
60 : $P_{671} = (14, 8, 1, 1)$ lies on line ℓ_{14}
61 : $P_{678} = (5, 9, 1, 1)$ lies on line ℓ_{14}
62 : $P_{685} = (12, 9, 1, 1)$ lies on line ℓ_{13}
63 : $P_{690} = (1, 10, 1, 1)$ lies on line ℓ_{14}
64 : $P_{700} = (11, 10, 1, 1)$ lies on line ℓ_{13}
65 : $P_{706} = (1, 11, 1, 1)$ lies on line ℓ_{13}
66 : $P_{715} = (10, 11, 1, 1)$ lies on line ℓ_{14}
67 : $P_{726} = (5, 12, 1, 1)$ lies on line ℓ_{13}
68 : $P_{730} = (9, 12, 1, 1)$ lies on line ℓ_{14}
69 : $P_{739} = (2, 13, 1, 1)$ lies on line ℓ_{14}
70 : $P_{752} = (15, 13, 1, 1)$ lies on line ℓ_{13}
71 : $P_{759} = (6, 14, 1, 1)$ lies on line ℓ_{14}
72 : $P_{761} = (8, 14, 1, 1)$ lies on line ℓ_{13}
73 : $P_{771} = (2, 15, 1, 1)$ lies on line ℓ_{13}
74 : $P_{782} = (13, 15, 1, 1)$ lies on line ℓ_{14}
75 : $P_{806} = (5, 1, 2, 1)$ lies on line ℓ_8
76 : $P_{808} = (7, 1, 2, 1)$ lies on line ℓ_{10}
77 : $P_{827} = (10, 2, 2, 1)$ lies on line ℓ_8
78 : $P_{831} = (14, 2, 2, 1)$ lies on line ℓ_{10}
79 : $P_{842} = (9, 3, 2, 1)$ lies on line ℓ_{10}
80 : $P_{848} = (15, 3, 2, 1)$ lies on line ℓ_8
81 : $P_{854} = (5, 4, 2, 1)$ lies on line ℓ_{10}
82 : $P_{862} = (13, 4, 2, 1)$ lies on line ℓ_8
83 : $P_{867} = (2, 5, 2, 1)$ lies on line ℓ_{10}
84 : $P_{873} = (8, 5, 2, 1)$ lies on line ℓ_8
85 : $P_{888} = (7, 6, 2, 1)$ lies on line ℓ_8
86 : $P_{892} = (11, 6, 2, 1)$ lies on line ℓ_{10}
87 : $P_{899} = (2, 7, 2, 1)$ lies on line ℓ_8
88 : $P_{909} = (12, 7, 2, 1)$ lies on line ℓ_{10}
89 : $P_{916} = (3, 8, 2, 1)$ lies on line ℓ_8
90 : $P_{923} = (10, 8, 2, 1)$ lies on line ℓ_{10}
91 : $P_{935} = (6, 9, 2, 1)$ lies on line ℓ_8
92 : $P_{942} = (13, 9, 2, 1)$ lies on line ℓ_{10}
93 : $P_{949} = (4, 10, 2, 1)$ lies on line ℓ_{10}
94 : $P_{954} = (9, 10, 2, 1)$ lies on line ℓ_8
95 : $P_{964} = (3, 11, 2, 1)$ lies on line ℓ_{10}
96 : $P_{973} = (12, 11, 2, 1)$ lies on line ℓ_8
97 : $P_{991} = (14, 12, 2, 1)$ lies on line ℓ_8
98 : $P_{992} = (15, 12, 2, 1)$ lies on line ℓ_{10}
99 : $P_{1001} = (8, 13, 2, 1)$ lies on line ℓ_{10}
100 : $P_{1004} = (11, 13, 2, 1)$ lies on line ℓ_8
101 : $P_{1010} = (1, 14, 2, 1)$ lies on line ℓ_{10}
102 : $P_{1013} = (4, 14, 2, 1)$ lies on line ℓ_8
103 : $P_{1026} = (1, 15, 2, 1)$ lies on line ℓ_8
104 : $P_{1031} = (6, 15, 2, 1)$ lies on line ℓ_{10}
105 : $P_{1041} = (0, 0, 3, 1)$ lies on line ℓ_4
106 : $P_{1321} = (8, 1, 4, 1)$ lies on line ℓ_{11}
107 : $P_{1325} = (12, 1, 4, 1)$ lies on line ℓ_{15}
108 : $P_{1330} = (1, 2, 4, 1)$ lies on line ℓ_{15}
109 : $P_{1338} = (9, 2, 4, 1)$ lies on line ℓ_{11}
110 : $P_{1346} = (1, 3, 4, 1)$ lies on line ℓ_{11}
111 : $P_{1358} = (13, 3, 4, 1)$ lies on line ℓ_{15}
112 : $P_{1363} = (2, 4, 4, 1)$ lies on line ℓ_{15}
113 : $P_{1372} = (11, 4, 4, 1)$ lies on line ℓ_{11}
114 : $P_{1380} = (3, 5, 4, 1)$ lies on line ℓ_{11}
115 : $P_{1391} = (14, 5, 4, 1)$ lies on line ℓ_{15}
116 : $P_{1395} = (2, 6, 4, 1)$ lies on line ℓ_{11}
117 : $P_{1396} = (3, 6, 4, 1)$ lies on line ℓ_{15}
118 : $P_{1419} = (10, 7, 4, 1)$ lies on line ℓ_{11}
119 : $P_{1424} = (15, 7, 4, 1)$ lies on line ℓ_{15}
120 : $P_{1429} = (4, 8, 4, 1)$ lies on line ℓ_{15}
121 : $P_{1440} = (15, 8, 4, 1)$ lies on line ℓ_{11}
122 : $P_{1448} = (7, 9, 4, 1)$ lies on line ℓ_{11}
123 : $P_{1449} = (8, 9, 4, 1)$ lies on line ℓ_{15}
124 : $P_{1462} = (5, 10, 4, 1)$ lies on line ℓ_{15}
125 : $P_{1463} = (6, 10, 4, 1)$ lies on line ℓ_{11}
126 : $P_{1482} = (9, 11, 4, 1)$ lies on line ℓ_{15}
127 : $P_{1487} = (14, 11, 4, 1)$ lies on line ℓ_{11}
128 : $P_{1493} = (4, 12, 4, 1)$ lies on line ℓ_{11}
129 : $P_{1495} = (6, 12, 4, 1)$ lies on line ℓ_{15}
130 : $P_{1515} = (10, 13, 4, 1)$ lies on line ℓ_{15}
131 : $P_{1517} = (12, 13, 4, 1)$ lies on line ℓ_{11}
132 : $P_{1528} = (7, 14, 4, 1)$ lies on line ℓ_{15}
133 : $P_{1534} = (13, 14, 4, 1)$ lies on line ℓ_{11}
134 : $P_{1542} = (5, 15, 4, 1)$ lies on line ℓ_{11}
135 : $P_{1548} = (11, 15, 4, 1)$ lies on line ℓ_{15}
136 : $P_{1553} = (0, 0, 5, 1)$ lies on line ℓ_4
137 : $P_{1809} = (0, 0, 6, 1)$ lies on line ℓ_4
138 : $P_{2065} = (0, 0, 7, 1)$ lies on line ℓ_4
139 : $P_{2321} = (0, 0, 8, 1)$ lies on line ℓ_4
140 : $P_{2599} = (6, 1, 9, 1)$ lies on line ℓ_9
141 : $P_{2608} = (15, 1, 9, 1)$ lies on line ℓ_{18}
142 : $P_{2616} = (7, 2, 9, 1)$ lies on line ℓ_{18}
143 : $P_{2621} = (12, 2, 9, 1)$ lies on line ℓ_9
144 : $P_{2633} = (8, 3, 9, 1)$ lies on line ℓ_{18}
145 : $P_{2635} = (10, 3, 9, 1)$ lies on line ℓ_9

146 : $P_{2642} = (1, 4, 9, 1)$ lies on line ℓ_9
147 : $P_{2655} = (14, 4, 9, 1)$ lies on line ℓ_{18}
148 : $P_{2658} = (1, 5, 9, 1)$ lies on line ℓ_{18}
149 : $P_{2664} = (7, 5, 9, 1)$ lies on line ℓ_9
150 : $P_{2682} = (9, 6, 9, 1)$ lies on line ℓ_{18}
151 : $P_{2686} = (13, 6, 9, 1)$ lies on line ℓ_9
152 : $P_{2695} = (6, 7, 9, 1)$ lies on line ℓ_{18}
153 : $P_{2700} = (11, 7, 9, 1)$ lies on line ℓ_9
154 : $P_{2707} = (2, 8, 9, 1)$ lies on line ℓ_9
155 : $P_{2710} = (5, 8, 9, 1)$ lies on line ℓ_{18}
156 : $P_{2725} = (4, 9, 9, 1)$ lies on line ℓ_9
157 : $P_{2731} = (10, 9, 9, 1)$ lies on line ℓ_{18}
158 : $P_{2739} = (2, 10, 9, 1)$ lies on line ℓ_{18}
159 : $P_{2751} = (14, 10, 9, 1)$ lies on line ℓ_9
160 : $P_{2761} = (8, 11, 9, 1)$ lies on line ℓ_9
161 : $P_{2766} = (13, 11, 9, 1)$ lies on line ℓ_{18}
162 : $P_{2772} = (3, 12, 9, 1)$ lies on line ℓ_9
163 : $P_{2780} = (11, 12, 9, 1)$ lies on line ℓ_{18}
164 : $P_{2789} = (4, 13, 9, 1)$ lies on line ℓ_{18}
165 : $P_{2790} = (5, 13, 9, 1)$ lies on line ℓ_9
166 : $P_{2813} = (12, 14, 9, 1)$ lies on line ℓ_{18}
167 : $P_{2816} = (15, 14, 9, 1)$ lies on line ℓ_9
168 : $P_{2820} = (3, 15, 9, 1)$ lies on line ℓ_{18}
169 : $P_{2826} = (9, 15, 9, 1)$ lies on line ℓ_9
170 : $P_{2853} = (4, 1, 10, 1)$ lies on line ℓ_7
171 : $P_{2863} = (14, 1, 10, 1)$ lies on line ℓ_{17}
172 : $P_{2870} = (5, 2, 10, 1)$ lies on line ℓ_{17}
173 : $P_{2873} = (8, 2, 10, 1)$ lies on line ℓ_7
174 : $P_{2892} = (11, 3, 10, 1)$ lies on line ℓ_{17}
175 : $P_{2893} = (12, 3, 10, 1)$ lies on line ℓ_7
176 : $P_{2906} = (9, 4, 10, 1)$ lies on line ℓ_7
177 : $P_{2907} = (10, 4, 10, 1)$ lies on line ℓ_{17}
178 : $P_{2917} = (4, 5, 10, 1)$ lies on line ℓ_{17}
179 : $P_{2926} = (13, 5, 10, 1)$ lies on line ℓ_7
180 : $P_{2930} = (1, 6, 10, 1)$ lies on line ℓ_7
181 : $P_{2944} = (15, 6, 10, 1)$ lies on line ℓ_{17}
182 : $P_{2946} = (1, 7, 10, 1)$ lies on line ℓ_{17}
183 : $P_{2950} = (5, 7, 10, 1)$ lies on line ℓ_7
184 : $P_{2972} = (11, 8, 10, 1)$ lies on line ℓ_7
185 : $P_{2974} = (13, 8, 10, 1)$ lies on line ℓ_{17}
186 : $P_{2980} = (3, 9, 10, 1)$ lies on line ℓ_{17}
187 : $P_{2992} = (15, 9, 10, 1)$ lies on line ℓ_7
188 : $P_{2996} = (3, 10, 10, 1)$ lies on line ℓ_7
189 : $P_{3001} = (8, 10, 10, 1)$ lies on line ℓ_{17}
190 : $P_{3015} = (6, 11, 10, 1)$ lies on line ℓ_{17}
191 : $P_{3016} = (7, 11, 10, 1)$ lies on line ℓ_7
192 : $P_{3027} = (2, 12, 10, 1)$ lies on line ℓ_7
193 : $P_{3032} = (7, 12, 10, 1)$ lies on line ℓ_{17}
194 : $P_{3047} = (6, 13, 10, 1)$ lies on line ℓ_7
195 : $P_{3050} = (9, 13, 10, 1)$ lies on line ℓ_{17}
196 : $P_{3059} = (2, 14, 10, 1)$ lies on line ℓ_{17}
197 : $P_{3067} = (10, 14, 10, 1)$ lies on line ℓ_7
198 : $P_{3085} = (12, 15, 10, 1)$ lies on line ℓ_{17}
199 : $P_{3087} = (14, 15, 10, 1)$ lies on line ℓ_7
200 : $P_{3107} = (2, 1, 11, 1)$ lies on line ℓ_5
201 : $P_{3114} = (9, 1, 11, 1)$ lies on line ℓ_{12}
202 : $P_{3125} = (4, 2, 11, 1)$ lies on line ℓ_5
203 : $P_{3132} = (11, 2, 11, 1)$ lies on line ℓ_{12}
204 : $P_{3139} = (2, 3, 11, 1)$ lies on line ℓ_{12}
205 : $P_{3143} = (6, 3, 11, 1)$ lies on line ℓ_5
206 : $P_{3161} = (8, 4, 11, 1)$ lies on line ℓ_5
207 : $P_{3168} = (15, 4, 11, 1)$ lies on line ℓ_{12}
208 : $P_{3175} = (6, 5, 11, 1)$ lies on line ℓ_{12}
209 : $P_{3179} = (10, 5, 11, 1)$ lies on line ℓ_5
210 : $P_{3189} = (4, 6, 11, 1)$ lies on line ℓ_{12}
211 : $P_{3197} = (12, 6, 11, 1)$ lies on line ℓ_5
212 : $P_{3214} = (13, 7, 11, 1)$ lies on line ℓ_{12}
213 : $P_{3215} = (14, 7, 11, 1)$ lies on line ℓ_5
214 : $P_{3224} = (7, 8, 11, 1)$ lies on line ℓ_{12}
215 : $P_{3226} = (9, 8, 11, 1)$ lies on line ℓ_5
216 : $P_{3244} = (11, 9, 11, 1)$ lies on line ℓ_5
217 : $P_{3247} = (14, 9, 11, 1)$ lies on line ℓ_{12}
218 : $P_{3261} = (12, 10, 11, 1)$ lies on line ℓ_{12}
219 : $P_{3262} = (13, 10, 11, 1)$ lies on line ℓ_5
220 : $P_{3270} = (5, 11, 11, 1)$ lies on line ℓ_{12}
221 : $P_{3280} = (15, 11, 11, 1)$ lies on line ℓ_5
222 : $P_{3282} = (1, 12, 11, 1)$ lies on line ℓ_5
223 : $P_{3289} = (8, 12, 11, 1)$ lies on line ℓ_{12}
224 : $P_{3298} = (1, 13, 11, 1)$ lies on line ℓ_{12}
225 : $P_{3300} = (3, 13, 11, 1)$ lies on line ℓ_5
226 : $P_{3316} = (3, 14, 11, 1)$ lies on line ℓ_{12}
227 : $P_{3318} = (5, 14, 11, 1)$ lies on line ℓ_5
228 : $P_{3336} = (7, 15, 11, 1)$ lies on line ℓ_5
229 : $P_{3339} = (10, 15, 11, 1)$ lies on line ℓ_{12}
230 : $P_{3345} = (0, 0, 12, 1)$ lies on line ℓ_4
231 : $P_{3601} = (0, 0, 13, 1)$ lies on line ℓ_4
232 : $P_{3876} = (3, 1, 14, 1)$ lies on line ℓ_6
233 : $P_{3886} = (13, 1, 14, 1)$ lies on line ℓ_{16}
234 : $P_{3892} = (3, 2, 14, 1)$ lies on line ℓ_{16}
235 : $P_{3895} = (6, 2, 14, 1)$ lies on line ℓ_6
236 : $P_{3910} = (5, 3, 14, 1)$ lies on line ℓ_6
237 : $P_{3919} = (14, 3, 14, 1)$ lies on line ℓ_{16}
238 : $P_{3927} = (6, 4, 14, 1)$ lies on line ℓ_{16}
239 : $P_{3933} = (12, 4, 14, 1)$ lies on line ℓ_6
240 : $P_{3948} = (11, 5, 14, 1)$ lies on line ℓ_{16}
241 : $P_{3952} = (15, 5, 14, 1)$ lies on line ℓ_6
242 : $P_{3958} = (5, 6, 14, 1)$ lies on line ℓ_{16}
243 : $P_{3963} = (10, 6, 14, 1)$ lies on line ℓ_6
244 : $P_{3977} = (8, 7, 14, 1)$ lies on line ℓ_{16}
245 : $P_{3978} = (9, 7, 14, 1)$ lies on line ℓ_6
246 : $P_{3986} = (1, 8, 14, 1)$ lies on line ℓ_6
247 : $P_{3997} = (12, 8, 14, 1)$ lies on line ℓ_{16}
248 : $P_{4002} = (1, 9, 14, 1)$ lies on line ℓ_{16}
249 : $P_{4003} = (2, 9, 14, 1)$ lies on line ℓ_6
250 : $P_{4024} = (7, 10, 14, 1)$ lies on line ℓ_6
251 : $P_{4032} = (15, 10, 14, 1)$ lies on line ℓ_{16}
252 : $P_{4035} = (2, 11, 14, 1)$ lies on line ℓ_{16}
253 : $P_{4037} = (4, 11, 14, 1)$ lies on line ℓ_6

254 : $P_{4059} = (10, 12, 14, 1)$ lies on line ℓ_{16}
255 : $P_{4062} = (13, 12, 14, 1)$ lies on line ℓ_6
256 : $P_{4072} = (7, 13, 14, 1)$ lies on line ℓ_{16}
257 : $P_{4079} = (14, 13, 14, 1)$ lies on line ℓ_6
258 : $P_{4090} = (9, 14, 14, 1)$ lies on line ℓ_{16}
259 : $P_{4092} = (11, 14, 14, 1)$ lies on line ℓ_6
260 : $P_{4101} = (4, 15, 14, 1)$ lies on line ℓ_{16}
261 : $P_{4105} = (8, 15, 14, 1)$ lies on line ℓ_6
262 : $P_{4113} = (0, 0, 15, 1)$ lies on line ℓ_4

The single points on the surface are:

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
0	0	1	1	1	0	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
2	1	1	0	0	1	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
4	0	1	1	1	0	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	1	0	0	0	0	0	0
6	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
7	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8	1	0	0	0	1	0	0	0	0	0	1	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	1
10	1	0	0	0	1	0	0	0	1	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	1	0	0	0
12	1	0	0	0	1	1	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	1	0	0	0	0
14	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
16	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
17	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
18	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0

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}
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}

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}	ℓ_{16}	ℓ_{17}	ℓ_1
in point	P_2	P_2	P_3	P_{3089}	P_{3857}	P_{2833}	P_{785}	P_{2577}	P_{785}	P_{1297}	P_{3089}	P_{530}	P_{530}	P_{1297}	P_{3857}	P_{2833}	P_2

Line 5 intersects

Line	ℓ_0	ℓ_4	ℓ_{12}
in point	P_6	P_{3089}	P_{3089}

Line 6 intersects

Line	ℓ_0	ℓ_4	ℓ_{16}
in point	P_7	P_{3857}	P_{3857}

Line 7 intersects

Line	ℓ_0	ℓ_4	ℓ_{17}
in point	P_8	P_{2833}	P_{2833}

Line 8 intersects

Line	ℓ_0	ℓ_4	ℓ_{10}
in point	P_9	P_{785}	P_{785}

Line 9 intersects

Line	ℓ_0	ℓ_4	ℓ_{18}
in point	P_{10}	P_{2577}	P_{2577}

Line 10 intersects

Line	ℓ_0	ℓ_4	ℓ_8
in point	P_{11}	P_{785}	P_{785}

Line 11 intersects

Line	ℓ_0	ℓ_4	ℓ_{15}
in point	P_{12}	P_{1297}	P_{1297}

Line 12 intersects

Line	ℓ_0	ℓ_4	ℓ_5
in point	P_{13}	P_{3089}	P_{3089}

Line 13 intersects

Line	ℓ_0	ℓ_4	ℓ_{14}
in point	P_{14}	P_{530}	P_{530}

Line 14 intersects

Line	ℓ_0	ℓ_4	ℓ_{13}
in point	P_{15}	P_{530}	P_{530}

Line 15 intersects

Line	ℓ_0	ℓ_4	ℓ_{11}
in point	P_{16}	P_{1297}	P_{1297}

Line 16 intersects

Line	ℓ_0	ℓ_4	ℓ_6
in point	P_{17}	P_{3857}	P_{3857}

Line 17 intersects

Line	ℓ_0	ℓ_4	ℓ_7
in point	P_{18}	P_{2833}	P_{2833}

Line 18 intersects

Line	ℓ_0	ℓ_4	ℓ_9
in point	P_{19}	P_{2577}	P_{2577}

The surface has 289 points:
The points on the surface are:

$0: P_0 = (1,0,0,0)$
$1: P_1 = (0,1,0,0)$
$2: P_2 = (0,0,1,0)$
$3: P_3 = (0,0,0,1)$
$4: P_5 = (1,1,0,0)$
$5: P_6 = (2,1,0,0)$
$6: P_7 = (3,1,0,0)$
$7: P_8 = (4,1,0,0)$
$8: P_9 = (5,1,0,0)$
$9: P_{10} = (6,1,0,0)$
$10: P_{11} = (7,1,0,0)$
$11: P_{12} = (8,1,0,0)$
$12: P_{13} = (9,1,0,0)$
$13: P_{14} = (10,1,0,0)$
$14: P_{15} = (11,1,0,0)$
$15: P_{16} = (12,1,0,0)$
$16: P_{17} = (13,1,0,0)$
$17: P_{18} = (14,1,0,0)$
$18: P_{19} = (15,1,0,0)$
$19: P_{20} = (1,0,1,0)$
$20: P_{21} = (2,0,1,0)$
$21: P_{22} = (3,0,1,0)$
$22: P_{23} = (4,0,1,0)$
$23: P_{24} = (5,0,1,0)$
$24: P_{25} = (6,0,1,0)$
$25: P_{26} = (7,0,1,0)$
$26: P_{27} = (8,0,1,0)$
$27: P_{28} = (9,0,1,0)$
$28: P_{29} = (10,0,1,0)$
$29: P_{30} = (11,0,1,0)$
$30: P_{31} = (12,0,1,0)$
$31: P_{32} = (13,0,1,0)$
$32: P_{33} = (14,0,1,0)$
$33: P_{34} = (15,0,1,0)$
$34: P_{36} = (1,1,1,0)$
$35: P_{53} = (2,2,1,0)$
$36: P_{70} = (3,3,1,0)$
$37: P_{87} = (4,4,1,0)$
$38: P_{104} = (5,5,1,0)$
$39: P_{121} = (6,6,1,0)$
$40: P_{138} = (7,7,1,0)$
$41: P_{155} = (8,8,1,0)$
$42: P_{172} = (9,9,1,0)$
$43: P_{189} = (10,10,1,0)$
$44: P_{206} = (11,11,1,0)$
$45: P_{223} = (12,12,1,0)$
$46: P_{240} = (13,13,1,0)$
$47: P_{257} = (14,14,1,0)$
$48: P_{274} = (15,15,1,0)$
$49: P_{290} = (0,1,0,1)$
$50: P_{306} = (0,2,0,1)$
$51: P_{322} = (0,3,0,1)$
$52: P_{338} = (0,4,0,1)$
$53: P_{354} = (0,5,0,1)$
$54: P_{370} = (0,6,0,1)$
$55: P_{386} = (0,7,0,1)$
$56: P_{402} = (0,8,0,1)$
$57: P_{418} = (0,9,0,1)$
$58: P_{434} = (0,10,0,1)$
$59: P_{450} = (0,11,0,1)$
$60: P_{466} = (0,12,0,1)$
$61: P_{482} = (0,13,0,1)$
$62: P_{498} = (0,14,0,1)$
$63: P_{514} = (0,15,0,1)$
$64: P_{530} = (0,0,1,1)$
$65: P_{555} = (10,1,1,1)$
$66: P_{556} = (11,1,1,1)$
$67: P_{574} = (13,2,1,1)$
$68: P_{576} = (15,2,1,1)$
$69: P_{581} = (4,3,1,1)$
$70: P_{584} = (7,3,1,1)$
$71: P_{596} = (3,4,1,1)$
$72: P_{600} = (7,4,1,1)$
$73: P_{618} = (9,5,1,1)$
$74: P_{621} = (12,5,1,1)$
$75: P_{633} = (8,6,1,1)$
$76: P_{639} = (14,6,1,1)$
$77: P_{644} = (3,7,1,1)$
$78: P_{645} = (4,7,1,1)$
$79: P_{663} = (6,8,1,1)$
$80: P_{671} = (14,8,1,1)$
$81: P_{678} = (5,9,1,1)$
$82: P_{685} = (12,9,1,1)$
$83: P_{690} = (1,10,1,1)$
$84: P_{700} = (11,10,1,1)$
$85: P_{706} = (1,11,1,1)$
$86: P_{715} = (10,11,1,1)$
$87: P_{726} = (5,12,1,1)$
$88: P_{730} = (9,12,1,1)$
$89: P_{739} = (2,13,1,1)$
$90: P_{752} = (15,13,1,1)$
$91: P_{759} = (6,14,1,1)$
$92: P_{761} = (8,14,1,1)$
$93: P_{771} = (2,15,1,1)$
$94: P_{782} = (13,15,1,1)$
$95: P_{785} = (0,0,2,1)$
$96: P_{806} = (5,1,2,1)$
$97: P_{808} = (7,1,2,1)$
$98: P_{827} = (10,2,2,1)$
$99: P_{831} = (14,2,2,1)$
$100: P_{842} = (9,3,2,1)$
$101: P_{848} = (15,3,2,1)$
$102: P_{854} = (5,4,2,1)$
$103: P_{862} = (13,4,2,1)$
$104: P_{867} = (2,5,2,1)$
$105: P_{873} = (8,5,2,1)$
$106: P_{888} = (7,6,2,1)$
$107: P_{892} = (11,6,2,1)$
$108: P_{899} = (2,7,2,1)$
$109: P_{909} = (12,7,2,1)$
$110: P_{916} = (3,8,2,1)$
$111: P_{923} = (10,8,2,1)$
$112: P_{935} = (6,9,2,1)$
$113: P_{942} = (13,9,2,1)$
$114: P_{949} = (4,10,2,1)$
$115: P_{954} = (9,10,2,1)$
$116: P_{964} = (3,11,2,1)$
$117: P_{973} = (12,11,2,1)$
$118: P_{991} = (14,12,2,1)$
$119: P_{992} = (15,12,2,1)$
$120: P_{1001} = (8,13,2,1)$
$121: P_{1004} = (11,13,2,1)$
$122: P_{1010} = (1,14,2,1)$
$123: P_{1013} = (4,14,2,1)$
$124: P_{1026} = (1,15,2,1)$
$125: P_{1031} = (6,15,2,1)$
$126: P_{1041} = (0,0,3,1)$
$127: P_{1297} = (0,0,4,1)$
$128: P_{1321} = (8,1,4,1)$
$129: P_{1325} = (12,1,4,1)$
$130: P_{1330} = (1,2,4,1)$
$131: P_{1338} = (9,2,4,1)$
$132: P_{1346} = (1,3,4,1)$
$133: P_{1358} = (13,3,4,1)$
$134: P_{1363} = (2,4,4,1)$
$135: P_{1372} = (11,4,4,1)$
$136: P_{1380} = (3,5,4,1)$
$137: P_{1391} = (14,5,4,1)$
$138: P_{1395} = (2,6,4,1)$
$139: P_{1396} = (3,6,4,1)$
$140: P_{1419} = (10,7,4,1)$
$141: P_{1424} = (15,7,4,1)$
$142: P_{1429} = (4,8,4,1)$
$143: P_{1440} = (15,8,4,1)$
$144: P_{1448} = (7,9,4,1)$
$145: P_{1449} = (8,9,4,1)$
$146: P_{1462} = (5,10,4,1)$
$147: P_{1463} = (6,10,4,1)$
$148: P_{1482} = (9,11,4,1)$
$149: P_{1487} = (14,11,4,1)$
$150: P_{1493} = (4,12,4,1)$
$151: P_{1495} = (6,12,4,1)$
$152: P_{1515} = (10,13,4,1)$
$153: P_{1517} = (12,13,4,1)$
$154: P_{1528} = (7,14,4,1)$
$155: P_{1534} = (13,14,4,1)$
$156: P_{1542} = (5,15,4,1)$
$157: P_{1548} = (11,15,4,1)$
$158: P_{1553} = (0,0,5,1)$
$159: P_{1809} = (0,0,6,1)$
$160: P_{2065} = (0,0,7,1)$
$161: P_{2321} = (0,0,8,1)$

$162: P_{2577} = (0, 0, 9, 1)$
$163: P_{2599} = (6, 1, 9, 1)$
$164: P_{2608} = (15, 1, 9, 1)$
$165: P_{2616} = (7, 2, 9, 1)$
$166: P_{2621} = (12, 2, 9, 1)$
$167: P_{2633} = (8, 3, 9, 1)$
$168: P_{2635} = (10, 3, 9, 1)$
$169: P_{2642} = (1, 4, 9, 1)$
$170: P_{2655} = (14, 4, 9, 1)$
$171: P_{2658} = (1, 5, 9, 1)$
$172: P_{2664} = (7, 5, 9, 1)$
$173: P_{2682} = (9, 6, 9, 1)$
$174: P_{2686} = (13, 6, 9, 1)$
$175: P_{2695} = (6, 7, 9, 1)$
$176: P_{2700} = (11, 7, 9, 1)$
$177: P_{2707} = (2, 8, 9, 1)$
$178: P_{2710} = (5, 8, 9, 1)$
$179: P_{2725} = (4, 9, 9, 1)$
$180: P_{2731} = (10, 9, 9, 1)$
$181: P_{2739} = (2, 10, 9, 1)$
$182: P_{2751} = (14, 10, 9, 1)$
$183: P_{2761} = (8, 11, 9, 1)$
$184: P_{2766} = (13, 11, 9, 1)$
$185: P_{2772} = (3, 12, 9, 1)$
$186: P_{2780} = (11, 12, 9, 1)$
$187: P_{2789} = (4, 13, 9, 1)$
$188: P_{2790} = (5, 13, 9, 1)$
$189: P_{2813} = (12, 14, 9, 1)$
$190: P_{2816} = (15, 14, 9, 1)$
$191: P_{2820} = (3, 15, 9, 1)$
$192: P_{2826} = (9, 15, 9, 1)$
$193: P_{2833} = (0, 0, 10, 1)$
$194: P_{2853} = (4, 1, 10, 1)$
$195: P_{2863} = (14, 1, 10, 1)$
$196: P_{2870} = (5, 2, 10, 1)$
$197: P_{2873} = (8, 2, 10, 1)$
$198: P_{2892} = (11, 3, 10, 1)$
$199: P_{2893} = (12, 3, 10, 1)$
$200: P_{2906} = (9, 4, 10, 1)$
$201: P_{2907} = (10, 4, 10, 1)$
$202: P_{2917} = (4, 5, 10, 1)$
$203: P_{2926} = (13, 5, 10, 1)$
$204: P_{2930} = (1, 6, 10, 1)$
$205: P_{2944} = (15, 6, 10, 1)$
$206: P_{2946} = (1, 7, 10, 1)$
$207: P_{2950} = (5, 7, 10, 1)$
$208: P_{2972} = (11, 8, 10, 1)$
$209: P_{2974} = (13, 8, 10, 1)$
$210: P_{2980} = (3, 9, 10, 1)$
$211: P_{2992} = (15, 9, 10, 1)$
$212: P_{2996} = (3, 10, 10, 1)$
$213: P_{3001} = (8, 10, 10, 1)$
$214: P_{3015} = (6, 11, 10, 1)$
$215: P_{3016} = (7, 11, 10, 1)$
$216: P_{3027} = (2, 12, 10, 1)$
$217: P_{3032} = (7, 12, 10, 1)$
$218: P_{3047} = (6, 13, 10, 1)$
$219: P_{3050} = (9, 13, 10, 1)$
$220: P_{3059} = (2, 14, 10, 1)$
$221: P_{3067} = (10, 14, 10, 1)$
$222: P_{3085} = (12, 15, 10, 1)$
$223: P_{3087} = (14, 15, 10, 1)$
$224: P_{3089} = (0, 0, 11, 1)$
$225: P_{3107} = (2, 1, 11, 1)$
$226: P_{3114} = (9, 1, 11, 1)$
$227: P_{3125} = (4, 2, 11, 1)$
$228: P_{3132} = (11, 2, 11, 1)$
$229: P_{3139} = (2, 3, 11, 1)$
$230: P_{3143} = (6, 3, 11, 1)$
$231: P_{3161} = (8, 4, 11, 1)$
$232: P_{3168} = (15, 4, 11, 1)$
$233: P_{3175} = (6, 5, 11, 1)$
$234: P_{3179} = (10, 5, 11, 1)$
$235: P_{3189} = (4, 6, 11, 1)$
$236: P_{3197} = (12, 6, 11, 1)$
$237: P_{3214} = (13, 7, 11, 1)$
$238: P_{3215} = (14, 7, 11, 1)$
$239: P_{3224} = (7, 8, 11, 1)$
$240: P_{3226} = (9, 8, 11, 1)$
$241: P_{3244} = (11, 9, 11, 1)$
$242: P_{3247} = (14, 9, 11, 1)$
$243: P_{3261} = (12, 10, 11, 1)$
$244: P_{3262} = (13, 10, 11, 1)$
$245: P_{3270} = (5, 11, 11, 1)$
$246: P_{3280} = (15, 11, 11, 1)$
$247: P_{3282} = (1, 12, 11, 1)$
$248: P_{3289} = (8, 12, 11, 1)$
$249: P_{3298} = (1, 13, 11, 1)$
$250: P_{3300} = (3, 13, 11, 1)$
$251: P_{3316} = (3, 14, 11, 1)$
$252: P_{3318} = (5, 14, 11, 1)$
$253: P_{3336} = (7, 15, 11, 1)$
$254: P_{3339} = (10, 15, 11, 1)$
$255: P_{3345} = (0, 0, 12, 1)$
$256: P_{3601} = (0, 0, 13, 1)$
$257: P_{3857} = (0, 0, 14, 1)$
$258: P_{3876} = (3, 1, 14, 1)$
$259: P_{3886} = (13, 1, 14, 1)$
$260: P_{3892} = (3, 2, 14, 1)$
$261: P_{3895} = (6, 2, 14, 1)$
$262: P_{3910} = (5, 3, 14, 1)$
$263: P_{3919} = (14, 3, 14, 1)$
$264: P_{3927} = (6, 4, 14, 1)$
$265: P_{3933} = (12, 4, 14, 1)$
$266: P_{3948} = (11, 5, 14, 1)$
$267: P_{3952} = (15, 5, 14, 1)$
$268: P_{3958} = (5, 6, 14, 1)$
$269: P_{3963} = (10, 6, 14, 1)$
$270: P_{3977} = (8, 7, 14, 1)$
$271: P_{3978} = (9, 7, 14, 1)$
$272: P_{3986} = (1, 8, 14, 1)$
$273: P_{3997} = (12, 8, 14, 1)$
$274: P_{4002} = (1, 9, 14, 1)$
$275: P_{4003} = (2, 9, 14, 1)$
$276: P_{4024} = (7, 10, 14, 1)$
$277: P_{4032} = (15, 10, 14, 1)$
$278: P_{4035} = (2, 11, 14, 1)$
$279: P_{4037} = (4, 11, 14, 1)$
$280: P_{4059} = (10, 12, 14, 1)$
$281: P_{4062} = (13, 12, 14, 1)$
$282: P_{4072} = (7, 13, 14, 1)$
$283: P_{4079} = (14, 13, 14, 1)$
$284: P_{4090} = (9, 14, 14, 1)$
$285: P_{4092} = (11, 14, 14, 1)$
$286: P_{4101} = (4, 15, 14, 1)$
$287: P_{4105} = (8, 15, 14, 1)$
$288: P_{4113} = (0, 0, 15, 1)$