

Rank-67107 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is -2130440123

General information

Number of lines	6
Number of points	4289
Number of singular points	1
Number of Eckardt points	1
Number of double points	6
Number of single points	375
Number of points off lines	3907
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^6
Type of lines on points	$3, 2^6, 1^{375}, 0^{3907}$

Singular Points

The surface has 1 singular points:

$$0 : P_3 = \mathbf{P}(0, 0, 0, 1) = \mathbf{P}(0, 0, 0, 1)$$

The 6 Lines

The lines and their Pluecker coordinates are:

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

$$\begin{aligned}
\ell_1 &= \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{4162} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{4162} = \mathbf{Pl}(1, 0, 1, 0, 0, 1)_{270529} \\
\ell_2 &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{17043456} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{17043456} = \mathbf{Pl}(0, 0, 0, 0, 0, 1)_{270401} \\
\ell_3 &= \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{4160} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{4160} = \mathbf{Pl}(0, 0, 0, 0, 1, 0)_{4225} \\
\ell_4 &= \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \mathbf{Pl}(0, 1, 0, 0, 0, 0)_1 \\
\ell_5 &= \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{270464} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{270464} = \mathbf{Pl}(0, 1, 0, 0, 1, 0)_{4289}
\end{aligned}$$

Rank of lines: (0, 4162, 17043456, 4160, 17047616, 270464)

Rank of points on Klein quadric: (0, 270529, 270401, 4225, 1, 4289)

Eckardt Points

The surface has 1 Eckardt points:

$$0 : P_3 = \mathbf{P}(0, 0, 0, 1) = \mathbf{P}(0, 0, 0, 1).$$

Double Points

The surface has 6 Double points:

The double points on the surface are:

$$\begin{aligned}
P_5 &= (1, 1, 0, 0) = \ell_0 \cap \ell_1 & P_{68} &= (1, 0, 1, 0) = \ell_1 \cap \ell_5 \\
P_1 &= (0, 1, 0, 0) = \ell_0 \cap \ell_2 & P_2 &= (0, 0, 1, 0) = \ell_2 \cap \ell_4 \\
P_0 &= (1, 0, 0, 0) = \ell_0 \cap \ell_3 \\
P_{131} &= (0, 1, 1, 0) = \ell_1 \cap \ell_2
\end{aligned}$$

Single Points

The surface has 375 single points:

The single points on the surface are:

$$\begin{aligned}
0 : P_6 &= (2, 1, 0, 0) \text{ lies on line } \ell_0 & 15 : P_{21} &= (17, 1, 0, 0) \text{ lies on line } \ell_0 \\
1 : P_7 &= (3, 1, 0, 0) \text{ lies on line } \ell_0 & 16 : P_{22} &= (18, 1, 0, 0) \text{ lies on line } \ell_0 \\
2 : P_8 &= (4, 1, 0, 0) \text{ lies on line } \ell_0 & 17 : P_{23} &= (19, 1, 0, 0) \text{ lies on line } \ell_0 \\
3 : P_9 &= (5, 1, 0, 0) \text{ lies on line } \ell_0 & 18 : P_{24} &= (20, 1, 0, 0) \text{ lies on line } \ell_0 \\
4 : P_{10} &= (6, 1, 0, 0) \text{ lies on line } \ell_0 & 19 : P_{25} &= (21, 1, 0, 0) \text{ lies on line } \ell_0 \\
5 : P_{11} &= (7, 1, 0, 0) \text{ lies on line } \ell_0 & 20 : P_{26} &= (22, 1, 0, 0) \text{ lies on line } \ell_0 \\
6 : P_{12} &= (8, 1, 0, 0) \text{ lies on line } \ell_0 & 21 : P_{27} &= (23, 1, 0, 0) \text{ lies on line } \ell_0 \\
7 : P_{13} &= (9, 1, 0, 0) \text{ lies on line } \ell_0 & 22 : P_{28} &= (24, 1, 0, 0) \text{ lies on line } \ell_0 \\
8 : P_{14} &= (10, 1, 0, 0) \text{ lies on line } \ell_0 & 23 : P_{29} &= (25, 1, 0, 0) \text{ lies on line } \ell_0 \\
9 : P_{15} &= (11, 1, 0, 0) \text{ lies on line } \ell_0 & 24 : P_{30} &= (26, 1, 0, 0) \text{ lies on line } \ell_0 \\
10 : P_{16} &= (12, 1, 0, 0) \text{ lies on line } \ell_0 & 25 : P_{31} &= (27, 1, 0, 0) \text{ lies on line } \ell_0 \\
11 : P_{17} &= (13, 1, 0, 0) \text{ lies on line } \ell_0 & 26 : P_{32} &= (28, 1, 0, 0) \text{ lies on line } \ell_0 \\
12 : P_{18} &= (14, 1, 0, 0) \text{ lies on line } \ell_0 & 27 : P_{33} &= (29, 1, 0, 0) \text{ lies on line } \ell_0 \\
13 : P_{19} &= (15, 1, 0, 0) \text{ lies on line } \ell_0 & 28 : P_{34} &= (30, 1, 0, 0) \text{ lies on line } \ell_0 \\
14 : P_{20} &= (16, 1, 0, 0) \text{ lies on line } \ell_0 & 29 : P_{35} &= (31, 1, 0, 0) \text{ lies on line } \ell_0
\end{aligned}$$

30 : $P_{36} = (32, 1, 0, 0)$ lies on line ℓ_0
 31 : $P_{37} = (33, 1, 0, 0)$ lies on line ℓ_0
 32 : $P_{38} = (34, 1, 0, 0)$ lies on line ℓ_0
 33 : $P_{39} = (35, 1, 0, 0)$ lies on line ℓ_0
 34 : $P_{40} = (36, 1, 0, 0)$ lies on line ℓ_0
 35 : $P_{41} = (37, 1, 0, 0)$ lies on line ℓ_0
 36 : $P_{42} = (38, 1, 0, 0)$ lies on line ℓ_0
 37 : $P_{43} = (39, 1, 0, 0)$ lies on line ℓ_0
 38 : $P_{44} = (40, 1, 0, 0)$ lies on line ℓ_0
 39 : $P_{45} = (41, 1, 0, 0)$ lies on line ℓ_0
 40 : $P_{46} = (42, 1, 0, 0)$ lies on line ℓ_0
 41 : $P_{47} = (43, 1, 0, 0)$ lies on line ℓ_0
 42 : $P_{48} = (44, 1, 0, 0)$ lies on line ℓ_0
 43 : $P_{49} = (45, 1, 0, 0)$ lies on line ℓ_0
 44 : $P_{50} = (46, 1, 0, 0)$ lies on line ℓ_0
 45 : $P_{51} = (47, 1, 0, 0)$ lies on line ℓ_0
 46 : $P_{52} = (48, 1, 0, 0)$ lies on line ℓ_0
 47 : $P_{53} = (49, 1, 0, 0)$ lies on line ℓ_0
 48 : $P_{54} = (50, 1, 0, 0)$ lies on line ℓ_0
 49 : $P_{55} = (51, 1, 0, 0)$ lies on line ℓ_0
 50 : $P_{56} = (52, 1, 0, 0)$ lies on line ℓ_0
 51 : $P_{57} = (53, 1, 0, 0)$ lies on line ℓ_0
 52 : $P_{58} = (54, 1, 0, 0)$ lies on line ℓ_0
 53 : $P_{59} = (55, 1, 0, 0)$ lies on line ℓ_0
 54 : $P_{60} = (56, 1, 0, 0)$ lies on line ℓ_0
 55 : $P_{61} = (57, 1, 0, 0)$ lies on line ℓ_0
 56 : $P_{62} = (58, 1, 0, 0)$ lies on line ℓ_0
 57 : $P_{63} = (59, 1, 0, 0)$ lies on line ℓ_0
 58 : $P_{64} = (60, 1, 0, 0)$ lies on line ℓ_0
 59 : $P_{65} = (61, 1, 0, 0)$ lies on line ℓ_0
 60 : $P_{66} = (62, 1, 0, 0)$ lies on line ℓ_0
 61 : $P_{67} = (63, 1, 0, 0)$ lies on line ℓ_0
 62 : $P_{195} = (0, 2, 1, 0)$ lies on line ℓ_2
 63 : $P_{198} = (3, 2, 1, 0)$ lies on line ℓ_1
 64 : $P_{259} = (0, 3, 1, 0)$ lies on line ℓ_2
 65 : $P_{261} = (2, 3, 1, 0)$ lies on line ℓ_1
 66 : $P_{323} = (0, 4, 1, 0)$ lies on line ℓ_2
 67 : $P_{328} = (5, 4, 1, 0)$ lies on line ℓ_1
 68 : $P_{387} = (0, 5, 1, 0)$ lies on line ℓ_2
 69 : $P_{391} = (4, 5, 1, 0)$ lies on line ℓ_1
 70 : $P_{451} = (0, 6, 1, 0)$ lies on line ℓ_2
 71 : $P_{458} = (7, 6, 1, 0)$ lies on line ℓ_1
 72 : $P_{515} = (0, 7, 1, 0)$ lies on line ℓ_2
 73 : $P_{521} = (6, 7, 1, 0)$ lies on line ℓ_1
 74 : $P_{579} = (0, 8, 1, 0)$ lies on line ℓ_2
 75 : $P_{588} = (9, 8, 1, 0)$ lies on line ℓ_1
 76 : $P_{643} = (0, 9, 1, 0)$ lies on line ℓ_2
 77 : $P_{651} = (8, 9, 1, 0)$ lies on line ℓ_1
 78 : $P_{707} = (0, 10, 1, 0)$ lies on line ℓ_2
 79 : $P_{718} = (11, 10, 1, 0)$ lies on line ℓ_1
 80 : $P_{771} = (0, 11, 1, 0)$ lies on line ℓ_2
 81 : $P_{781} = (10, 11, 1, 0)$ lies on line ℓ_1
 82 : $P_{835} = (0, 12, 1, 0)$ lies on line ℓ_2
 83 : $P_{848} = (13, 12, 1, 0)$ lies on line ℓ_1

84 : $P_{899} = (0, 13, 1, 0)$ lies on line ℓ_2
 85 : $P_{911} = (12, 13, 1, 0)$ lies on line ℓ_1
 86 : $P_{963} = (0, 14, 1, 0)$ lies on line ℓ_2
 87 : $P_{978} = (15, 14, 1, 0)$ lies on line ℓ_1
 88 : $P_{1027} = (0, 15, 1, 0)$ lies on line ℓ_2
 89 : $P_{1041} = (14, 15, 1, 0)$ lies on line ℓ_1
 90 : $P_{1091} = (0, 16, 1, 0)$ lies on line ℓ_2
 91 : $P_{1108} = (17, 16, 1, 0)$ lies on line ℓ_1
 92 : $P_{1155} = (0, 17, 1, 0)$ lies on line ℓ_2
 93 : $P_{1171} = (16, 17, 1, 0)$ lies on line ℓ_1
 94 : $P_{1219} = (0, 18, 1, 0)$ lies on line ℓ_2
 95 : $P_{1238} = (19, 18, 1, 0)$ lies on line ℓ_1
 96 : $P_{1283} = (0, 19, 1, 0)$ lies on line ℓ_2
 97 : $P_{1301} = (18, 19, 1, 0)$ lies on line ℓ_1
 98 : $P_{1347} = (0, 20, 1, 0)$ lies on line ℓ_2
 99 : $P_{1368} = (21, 20, 1, 0)$ lies on line ℓ_1
 100 : $P_{1411} = (0, 21, 1, 0)$ lies on line ℓ_2
 101 : $P_{1431} = (20, 21, 1, 0)$ lies on line ℓ_1
 102 : $P_{1475} = (0, 22, 1, 0)$ lies on line ℓ_2
 103 : $P_{1498} = (23, 22, 1, 0)$ lies on line ℓ_1
 104 : $P_{1539} = (0, 23, 1, 0)$ lies on line ℓ_2
 105 : $P_{1561} = (22, 23, 1, 0)$ lies on line ℓ_1
 106 : $P_{1603} = (0, 24, 1, 0)$ lies on line ℓ_2
 107 : $P_{1628} = (25, 24, 1, 0)$ lies on line ℓ_1
 108 : $P_{1667} = (0, 25, 1, 0)$ lies on line ℓ_2
 109 : $P_{1691} = (24, 25, 1, 0)$ lies on line ℓ_1
 110 : $P_{1731} = (0, 26, 1, 0)$ lies on line ℓ_2
 111 : $P_{1758} = (27, 26, 1, 0)$ lies on line ℓ_1
 112 : $P_{1795} = (0, 27, 1, 0)$ lies on line ℓ_2
 113 : $P_{1821} = (26, 27, 1, 0)$ lies on line ℓ_1
 114 : $P_{1859} = (0, 28, 1, 0)$ lies on line ℓ_2
 115 : $P_{1888} = (29, 28, 1, 0)$ lies on line ℓ_1
 116 : $P_{1923} = (0, 29, 1, 0)$ lies on line ℓ_2
 117 : $P_{1951} = (28, 29, 1, 0)$ lies on line ℓ_1
 118 : $P_{1987} = (0, 30, 1, 0)$ lies on line ℓ_2
 119 : $P_{2018} = (31, 30, 1, 0)$ lies on line ℓ_1
 120 : $P_{2051} = (0, 31, 1, 0)$ lies on line ℓ_2
 121 : $P_{2081} = (30, 31, 1, 0)$ lies on line ℓ_1
 122 : $P_{2115} = (0, 32, 1, 0)$ lies on line ℓ_2
 123 : $P_{2148} = (33, 32, 1, 0)$ lies on line ℓ_1
 124 : $P_{2179} = (0, 33, 1, 0)$ lies on line ℓ_2
 125 : $P_{2211} = (32, 33, 1, 0)$ lies on line ℓ_1
 126 : $P_{2243} = (0, 34, 1, 0)$ lies on line ℓ_2
 127 : $P_{2278} = (35, 34, 1, 0)$ lies on line ℓ_1
 128 : $P_{2307} = (0, 35, 1, 0)$ lies on line ℓ_2
 129 : $P_{2341} = (34, 35, 1, 0)$ lies on line ℓ_1
 130 : $P_{2371} = (0, 36, 1, 0)$ lies on line ℓ_2
 131 : $P_{2408} = (37, 36, 1, 0)$ lies on line ℓ_1
 132 : $P_{2435} = (0, 37, 1, 0)$ lies on line ℓ_2
 133 : $P_{2471} = (36, 37, 1, 0)$ lies on line ℓ_1
 134 : $P_{2499} = (0, 38, 1, 0)$ lies on line ℓ_2
 135 : $P_{2538} = (39, 38, 1, 0)$ lies on line ℓ_1
 136 : $P_{2563} = (0, 39, 1, 0)$ lies on line ℓ_2
 137 : $P_{2601} = (38, 39, 1, 0)$ lies on line ℓ_1

138 : $P_{2627} = (0, 40, 1, 0)$ lies on line ℓ_2
 139 : $P_{2668} = (41, 40, 1, 0)$ lies on line ℓ_1
 140 : $P_{2691} = (0, 41, 1, 0)$ lies on line ℓ_2
 141 : $P_{2731} = (40, 41, 1, 0)$ lies on line ℓ_1
 142 : $P_{2755} = (0, 42, 1, 0)$ lies on line ℓ_2
 143 : $P_{2798} = (43, 42, 1, 0)$ lies on line ℓ_1
 144 : $P_{2819} = (0, 43, 1, 0)$ lies on line ℓ_2
 145 : $P_{2861} = (42, 43, 1, 0)$ lies on line ℓ_1
 146 : $P_{2883} = (0, 44, 1, 0)$ lies on line ℓ_2
 147 : $P_{2928} = (45, 44, 1, 0)$ lies on line ℓ_1
 148 : $P_{2947} = (0, 45, 1, 0)$ lies on line ℓ_2
 149 : $P_{2991} = (44, 45, 1, 0)$ lies on line ℓ_1
 150 : $P_{3011} = (0, 46, 1, 0)$ lies on line ℓ_2
 151 : $P_{3058} = (47, 46, 1, 0)$ lies on line ℓ_1
 152 : $P_{3075} = (0, 47, 1, 0)$ lies on line ℓ_2
 153 : $P_{3121} = (46, 47, 1, 0)$ lies on line ℓ_1
 154 : $P_{3139} = (0, 48, 1, 0)$ lies on line ℓ_2
 155 : $P_{3188} = (49, 48, 1, 0)$ lies on line ℓ_1
 156 : $P_{3203} = (0, 49, 1, 0)$ lies on line ℓ_2
 157 : $P_{3251} = (48, 49, 1, 0)$ lies on line ℓ_1
 158 : $P_{3267} = (0, 50, 1, 0)$ lies on line ℓ_2
 159 : $P_{3318} = (51, 50, 1, 0)$ lies on line ℓ_1
 160 : $P_{3331} = (0, 51, 1, 0)$ lies on line ℓ_2
 161 : $P_{3381} = (50, 51, 1, 0)$ lies on line ℓ_1
 162 : $P_{3395} = (0, 52, 1, 0)$ lies on line ℓ_2
 163 : $P_{3448} = (53, 52, 1, 0)$ lies on line ℓ_1
 164 : $P_{3459} = (0, 53, 1, 0)$ lies on line ℓ_2
 165 : $P_{3511} = (52, 53, 1, 0)$ lies on line ℓ_1
 166 : $P_{3523} = (0, 54, 1, 0)$ lies on line ℓ_2
 167 : $P_{3578} = (55, 54, 1, 0)$ lies on line ℓ_1
 168 : $P_{3587} = (0, 55, 1, 0)$ lies on line ℓ_2
 169 : $P_{3641} = (54, 55, 1, 0)$ lies on line ℓ_1
 170 : $P_{3651} = (0, 56, 1, 0)$ lies on line ℓ_2
 171 : $P_{3708} = (57, 56, 1, 0)$ lies on line ℓ_1
 172 : $P_{3715} = (0, 57, 1, 0)$ lies on line ℓ_2
 173 : $P_{3771} = (56, 57, 1, 0)$ lies on line ℓ_1
 174 : $P_{3779} = (0, 58, 1, 0)$ lies on line ℓ_2
 175 : $P_{3838} = (59, 58, 1, 0)$ lies on line ℓ_1
 176 : $P_{3843} = (0, 59, 1, 0)$ lies on line ℓ_2
 177 : $P_{3901} = (58, 59, 1, 0)$ lies on line ℓ_1
 178 : $P_{3907} = (0, 60, 1, 0)$ lies on line ℓ_2
 179 : $P_{3968} = (61, 60, 1, 0)$ lies on line ℓ_1
 180 : $P_{3971} = (0, 61, 1, 0)$ lies on line ℓ_2
 181 : $P_{4031} = (60, 61, 1, 0)$ lies on line ℓ_1
 182 : $P_{4035} = (0, 62, 1, 0)$ lies on line ℓ_2
 183 : $P_{4098} = (63, 62, 1, 0)$ lies on line ℓ_1
 184 : $P_{4099} = (0, 63, 1, 0)$ lies on line ℓ_2
 185 : $P_{4161} = (62, 63, 1, 0)$ lies on line ℓ_1
 186 : $P_{4163} = (1, 0, 0, 1)$ lies on line ℓ_3
 187 : $P_{4164} = (2, 0, 0, 1)$ lies on line ℓ_3
 188 : $P_{4165} = (3, 0, 0, 1)$ lies on line ℓ_3
 189 : $P_{4166} = (4, 0, 0, 1)$ lies on line ℓ_3
 190 : $P_{4167} = (5, 0, 0, 1)$ lies on line ℓ_3
 191 : $P_{4168} = (6, 0, 0, 1)$ lies on line ℓ_3

192 : $P_{4169} = (7, 0, 0, 1)$ lies on line ℓ_3
 193 : $P_{4170} = (8, 0, 0, 1)$ lies on line ℓ_3
 194 : $P_{4171} = (9, 0, 0, 1)$ lies on line ℓ_3
 195 : $P_{4172} = (10, 0, 0, 1)$ lies on line ℓ_3
 196 : $P_{4173} = (11, 0, 0, 1)$ lies on line ℓ_3
 197 : $P_{4174} = (12, 0, 0, 1)$ lies on line ℓ_3
 198 : $P_{4175} = (13, 0, 0, 1)$ lies on line ℓ_3
 199 : $P_{4176} = (14, 0, 0, 1)$ lies on line ℓ_3
 200 : $P_{4177} = (15, 0, 0, 1)$ lies on line ℓ_3
 201 : $P_{4178} = (16, 0, 0, 1)$ lies on line ℓ_3
 202 : $P_{4179} = (17, 0, 0, 1)$ lies on line ℓ_3
 203 : $P_{4180} = (18, 0, 0, 1)$ lies on line ℓ_3
 204 : $P_{4181} = (19, 0, 0, 1)$ lies on line ℓ_3
 205 : $P_{4182} = (20, 0, 0, 1)$ lies on line ℓ_3
 206 : $P_{4183} = (21, 0, 0, 1)$ lies on line ℓ_3
 207 : $P_{4184} = (22, 0, 0, 1)$ lies on line ℓ_3
 208 : $P_{4185} = (23, 0, 0, 1)$ lies on line ℓ_3
 209 : $P_{4186} = (24, 0, 0, 1)$ lies on line ℓ_3
 210 : $P_{4187} = (25, 0, 0, 1)$ lies on line ℓ_3
 211 : $P_{4188} = (26, 0, 0, 1)$ lies on line ℓ_3
 212 : $P_{4189} = (27, 0, 0, 1)$ lies on line ℓ_3
 213 : $P_{4190} = (28, 0, 0, 1)$ lies on line ℓ_3
 214 : $P_{4191} = (29, 0, 0, 1)$ lies on line ℓ_3
 215 : $P_{4192} = (30, 0, 0, 1)$ lies on line ℓ_3
 216 : $P_{4193} = (31, 0, 0, 1)$ lies on line ℓ_3
 217 : $P_{4194} = (32, 0, 0, 1)$ lies on line ℓ_3
 218 : $P_{4195} = (33, 0, 0, 1)$ lies on line ℓ_3
 219 : $P_{4196} = (34, 0, 0, 1)$ lies on line ℓ_3
 220 : $P_{4197} = (35, 0, 0, 1)$ lies on line ℓ_3
 221 : $P_{4198} = (36, 0, 0, 1)$ lies on line ℓ_3
 222 : $P_{4199} = (37, 0, 0, 1)$ lies on line ℓ_3
 223 : $P_{4200} = (38, 0, 0, 1)$ lies on line ℓ_3
 224 : $P_{4201} = (39, 0, 0, 1)$ lies on line ℓ_3
 225 : $P_{4202} = (40, 0, 0, 1)$ lies on line ℓ_3
 226 : $P_{4203} = (41, 0, 0, 1)$ lies on line ℓ_3
 227 : $P_{4204} = (42, 0, 0, 1)$ lies on line ℓ_3
 228 : $P_{4205} = (43, 0, 0, 1)$ lies on line ℓ_3
 229 : $P_{4206} = (44, 0, 0, 1)$ lies on line ℓ_3
 230 : $P_{4207} = (45, 0, 0, 1)$ lies on line ℓ_3
 231 : $P_{4208} = (46, 0, 0, 1)$ lies on line ℓ_3
 232 : $P_{4209} = (47, 0, 0, 1)$ lies on line ℓ_3
 233 : $P_{4210} = (48, 0, 0, 1)$ lies on line ℓ_3
 234 : $P_{4211} = (49, 0, 0, 1)$ lies on line ℓ_3
 235 : $P_{4212} = (50, 0, 0, 1)$ lies on line ℓ_3
 236 : $P_{4213} = (51, 0, 0, 1)$ lies on line ℓ_3
 237 : $P_{4214} = (52, 0, 0, 1)$ lies on line ℓ_3
 238 : $P_{4215} = (53, 0, 0, 1)$ lies on line ℓ_3
 239 : $P_{4216} = (54, 0, 0, 1)$ lies on line ℓ_3
 240 : $P_{4217} = (55, 0, 0, 1)$ lies on line ℓ_3
 241 : $P_{4218} = (56, 0, 0, 1)$ lies on line ℓ_3
 242 : $P_{4219} = (57, 0, 0, 1)$ lies on line ℓ_3
 243 : $P_{4220} = (58, 0, 0, 1)$ lies on line ℓ_3
 244 : $P_{4221} = (59, 0, 0, 1)$ lies on line ℓ_3
 245 : $P_{4222} = (60, 0, 0, 1)$ lies on line ℓ_3

246 : $P_{4223} = (61, 0, 0, 1)$ lies on line ℓ_3
 247 : $P_{4224} = (62, 0, 0, 1)$ lies on line ℓ_3
 248 : $P_{4225} = (63, 0, 0, 1)$ lies on line ℓ_3
 249 : $P_{8258} = (0, 0, 1, 1)$ lies on line ℓ_4
 250 : $P_{8259} = (1, 0, 1, 1)$ lies on line ℓ_5
 251 : $P_{12353} = (0, 0, 2, 1)$ lies on line ℓ_4
 252 : $P_{12355} = (2, 0, 2, 1)$ lies on line ℓ_5
 253 : $P_{16449} = (0, 0, 3, 1)$ lies on line ℓ_4
 254 : $P_{16452} = (3, 0, 3, 1)$ lies on line ℓ_5
 255 : $P_{20545} = (0, 0, 4, 1)$ lies on line ℓ_4
 256 : $P_{20549} = (4, 0, 4, 1)$ lies on line ℓ_5
 257 : $P_{24641} = (0, 0, 5, 1)$ lies on line ℓ_4
 258 : $P_{24646} = (5, 0, 5, 1)$ lies on line ℓ_5
 259 : $P_{28737} = (0, 0, 6, 1)$ lies on line ℓ_4
 260 : $P_{28743} = (6, 0, 6, 1)$ lies on line ℓ_5
 261 : $P_{32833} = (0, 0, 7, 1)$ lies on line ℓ_4
 262 : $P_{32840} = (7, 0, 7, 1)$ lies on line ℓ_5
 263 : $P_{36929} = (0, 0, 8, 1)$ lies on line ℓ_4
 264 : $P_{36937} = (8, 0, 8, 1)$ lies on line ℓ_5
 265 : $P_{41025} = (0, 0, 9, 1)$ lies on line ℓ_4
 266 : $P_{41034} = (9, 0, 9, 1)$ lies on line ℓ_5
 267 : $P_{45121} = (0, 0, 10, 1)$ lies on line ℓ_4
 268 : $P_{45131} = (10, 0, 10, 1)$ lies on line ℓ_5
 269 : $P_{49217} = (0, 0, 11, 1)$ lies on line ℓ_4
 270 : $P_{49228} = (11, 0, 11, 1)$ lies on line ℓ_5
 271 : $P_{53313} = (0, 0, 12, 1)$ lies on line ℓ_4
 272 : $P_{53325} = (12, 0, 12, 1)$ lies on line ℓ_5
 273 : $P_{57409} = (0, 0, 13, 1)$ lies on line ℓ_4
 274 : $P_{57422} = (13, 0, 13, 1)$ lies on line ℓ_5
 275 : $P_{61505} = (0, 0, 14, 1)$ lies on line ℓ_4
 276 : $P_{61519} = (14, 0, 14, 1)$ lies on line ℓ_5
 277 : $P_{65601} = (0, 0, 15, 1)$ lies on line ℓ_4
 278 : $P_{65616} = (15, 0, 15, 1)$ lies on line ℓ_5
 279 : $P_{69697} = (0, 0, 16, 1)$ lies on line ℓ_4
 280 : $P_{69713} = (16, 0, 16, 1)$ lies on line ℓ_5
 281 : $P_{73793} = (0, 0, 17, 1)$ lies on line ℓ_4
 282 : $P_{73810} = (17, 0, 17, 1)$ lies on line ℓ_5
 283 : $P_{77889} = (0, 0, 18, 1)$ lies on line ℓ_4
 284 : $P_{77907} = (18, 0, 18, 1)$ lies on line ℓ_5
 285 : $P_{81985} = (0, 0, 19, 1)$ lies on line ℓ_4
 286 : $P_{82004} = (19, 0, 19, 1)$ lies on line ℓ_5
 287 : $P_{86081} = (0, 0, 20, 1)$ lies on line ℓ_4
 288 : $P_{86101} = (20, 0, 20, 1)$ lies on line ℓ_5
 289 : $P_{90177} = (0, 0, 21, 1)$ lies on line ℓ_4
 290 : $P_{90198} = (21, 0, 21, 1)$ lies on line ℓ_5
 291 : $P_{94273} = (0, 0, 22, 1)$ lies on line ℓ_4
 292 : $P_{94295} = (22, 0, 22, 1)$ lies on line ℓ_5
 293 : $P_{98369} = (0, 0, 23, 1)$ lies on line ℓ_4
 294 : $P_{98392} = (23, 0, 23, 1)$ lies on line ℓ_5
 295 : $P_{102465} = (0, 0, 24, 1)$ lies on line ℓ_4
 296 : $P_{102489} = (24, 0, 24, 1)$ lies on line ℓ_5
 297 : $P_{106561} = (0, 0, 25, 1)$ lies on line ℓ_4
 298 : $P_{106586} = (25, 0, 25, 1)$ lies on line ℓ_5
 299 : $P_{110657} = (0, 0, 26, 1)$ lies on line ℓ_4

300 : $P_{110683} = (26, 0, 26, 1)$ lies on line ℓ_5
 301 : $P_{114753} = (0, 0, 27, 1)$ lies on line ℓ_4
 302 : $P_{114780} = (27, 0, 27, 1)$ lies on line ℓ_5
 303 : $P_{118849} = (0, 0, 28, 1)$ lies on line ℓ_4
 304 : $P_{118877} = (28, 0, 28, 1)$ lies on line ℓ_5
 305 : $P_{122945} = (0, 0, 29, 1)$ lies on line ℓ_4
 306 : $P_{122974} = (29, 0, 29, 1)$ lies on line ℓ_5
 307 : $P_{127041} = (0, 0, 30, 1)$ lies on line ℓ_4
 308 : $P_{127071} = (30, 0, 30, 1)$ lies on line ℓ_5
 309 : $P_{131137} = (0, 0, 31, 1)$ lies on line ℓ_4
 310 : $P_{131168} = (31, 0, 31, 1)$ lies on line ℓ_5
 311 : $P_{135233} = (0, 0, 32, 1)$ lies on line ℓ_4
 312 : $P_{135265} = (32, 0, 32, 1)$ lies on line ℓ_5
 313 : $P_{139329} = (0, 0, 33, 1)$ lies on line ℓ_4
 314 : $P_{139362} = (33, 0, 33, 1)$ lies on line ℓ_5
 315 : $P_{143425} = (0, 0, 34, 1)$ lies on line ℓ_4
 316 : $P_{143459} = (34, 0, 34, 1)$ lies on line ℓ_5
 317 : $P_{147521} = (0, 0, 35, 1)$ lies on line ℓ_4
 318 : $P_{147556} = (35, 0, 35, 1)$ lies on line ℓ_5
 319 : $P_{151617} = (0, 0, 36, 1)$ lies on line ℓ_4
 320 : $P_{151653} = (36, 0, 36, 1)$ lies on line ℓ_5
 321 : $P_{155713} = (0, 0, 37, 1)$ lies on line ℓ_4
 322 : $P_{155750} = (37, 0, 37, 1)$ lies on line ℓ_5
 323 : $P_{159809} = (0, 0, 38, 1)$ lies on line ℓ_4
 324 : $P_{159847} = (38, 0, 38, 1)$ lies on line ℓ_5
 325 : $P_{163905} = (0, 0, 39, 1)$ lies on line ℓ_4
 326 : $P_{163944} = (39, 0, 39, 1)$ lies on line ℓ_5
 327 : $P_{168001} = (0, 0, 40, 1)$ lies on line ℓ_4
 328 : $P_{168041} = (40, 0, 40, 1)$ lies on line ℓ_5
 329 : $P_{172097} = (0, 0, 41, 1)$ lies on line ℓ_4
 330 : $P_{172138} = (41, 0, 41, 1)$ lies on line ℓ_5
 331 : $P_{176193} = (0, 0, 42, 1)$ lies on line ℓ_4
 332 : $P_{176235} = (42, 0, 42, 1)$ lies on line ℓ_5
 333 : $P_{180289} = (0, 0, 43, 1)$ lies on line ℓ_4
 334 : $P_{180332} = (43, 0, 43, 1)$ lies on line ℓ_5
 335 : $P_{184385} = (0, 0, 44, 1)$ lies on line ℓ_4
 336 : $P_{184429} = (44, 0, 44, 1)$ lies on line ℓ_5
 337 : $P_{188481} = (0, 0, 45, 1)$ lies on line ℓ_4
 338 : $P_{188526} = (45, 0, 45, 1)$ lies on line ℓ_5
 339 : $P_{192577} = (0, 0, 46, 1)$ lies on line ℓ_4
 340 : $P_{192623} = (46, 0, 46, 1)$ lies on line ℓ_5
 341 : $P_{196673} = (0, 0, 47, 1)$ lies on line ℓ_4
 342 : $P_{196720} = (47, 0, 47, 1)$ lies on line ℓ_5
 343 : $P_{200769} = (0, 0, 48, 1)$ lies on line ℓ_4
 344 : $P_{200817} = (48, 0, 48, 1)$ lies on line ℓ_5
 345 : $P_{204865} = (0, 0, 49, 1)$ lies on line ℓ_4
 346 : $P_{204914} = (49, 0, 49, 1)$ lies on line ℓ_5
 347 : $P_{208961} = (0, 0, 50, 1)$ lies on line ℓ_4
 348 : $P_{209011} = (50, 0, 50, 1)$ lies on line ℓ_5
 349 : $P_{213057} = (0, 0, 51, 1)$ lies on line ℓ_4
 350 : $P_{213108} = (51, 0, 51, 1)$ lies on line ℓ_5
 351 : $P_{217153} = (0, 0, 52, 1)$ lies on line ℓ_4
 352 : $P_{217205} = (52, 0, 52, 1)$ lies on line ℓ_5
 353 : $P_{221249} = (0, 0, 53, 1)$ lies on line ℓ_4

354 : $P_{221302} = (53, 0, 53, 1)$ lies on line ℓ_5
 355 : $P_{225345} = (0, 0, 54, 1)$ lies on line ℓ_4
 356 : $P_{225399} = (54, 0, 54, 1)$ lies on line ℓ_5
 357 : $P_{229441} = (0, 0, 55, 1)$ lies on line ℓ_4
 358 : $P_{229496} = (55, 0, 55, 1)$ lies on line ℓ_5
 359 : $P_{233537} = (0, 0, 56, 1)$ lies on line ℓ_4
 360 : $P_{233593} = (56, 0, 56, 1)$ lies on line ℓ_5
 361 : $P_{237633} = (0, 0, 57, 1)$ lies on line ℓ_4
 362 : $P_{237690} = (57, 0, 57, 1)$ lies on line ℓ_5
 363 : $P_{241729} = (0, 0, 58, 1)$ lies on line ℓ_4
 364 : $P_{241787} = (58, 0, 58, 1)$ lies on line ℓ_5

365 : $P_{245825} = (0, 0, 59, 1)$ lies on line ℓ_4
 366 : $P_{245884} = (59, 0, 59, 1)$ lies on line ℓ_5
 367 : $P_{249921} = (0, 0, 60, 1)$ lies on line ℓ_4
 368 : $P_{249981} = (60, 0, 60, 1)$ lies on line ℓ_5
 369 : $P_{254017} = (0, 0, 61, 1)$ lies on line ℓ_4
 370 : $P_{254078} = (61, 0, 61, 1)$ lies on line ℓ_5
 371 : $P_{258113} = (0, 0, 62, 1)$ lies on line ℓ_4
 372 : $P_{258175} = (62, 0, 62, 1)$ lies on line ℓ_5
 373 : $P_{262209} = (0, 0, 63, 1)$ lies on line ℓ_4
 374 : $P_{262272} = (63, 0, 63, 1)$ lies on line ℓ_5

The single points on the surface are:

Points on surface but on no line

The surface has 3907 points not on any line:
Too many to print.

Line Intersection Graph

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

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3
in point	P_5	P_1	P_0

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_5
in point	P_5	P_{131}	P_{68}

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_4
in point	P_1	P_{131}	P_2

Line 3 intersects

Line	ℓ_0	ℓ_4	ℓ_5
in point	P_0	P_3	P_3

Line 4 intersects

Line	ℓ_2	ℓ_3	ℓ_5
in point	P_2	P_3	P_3

Line 5 intersects

Line	ℓ_1	ℓ_3	ℓ_4
in point	P_{68}	P_3	P_3

The surface has 4289 points:
Too many to print.