

Rank-74243 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0, 1, 0, 0, 1, 0, 0, 0)

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

General information

Number of lines	4
Number of points	4225
Number of singular points	2
Number of Eckardt points	1
Number of double points	2
Number of single points	253
Number of points off lines	3969
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^4
Type of lines on points	$3, 2^2, 1^{253}, 0^{3969}$

Singular Points

The surface has 2 singular points:

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

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

The 4 Lines

The lines and their Pluecker coordinates are:

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

$$\begin{aligned}\ell_1 &= \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4096} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{4096} = \mathbf{Pl}(0, 0, 1, 0, 0, 0)_2 \\ \ell_2 &= \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{17043456} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{17043456} = \mathbf{Pl}(0, 0, 0, 0, 0, 1)_{270401} \\ \ell_3 &= \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \mathbf{Pl}(0, 1, 0, 0, 0, 0)_1\end{aligned}$$

Rank of lines: (0, 4096, 17043456, 17047616)

Rank of points on Klein quadric: (0, 2, 270401, 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 2 Double points:

The double points on the surface are:

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

$$P_1 = (0, 1, 0, 0) = \ell_0 \cap \ell_2$$

Single Points

The surface has 253 single points:

The single points on the surface are:

0 : $P_3 = (0, 0, 0, 1)$ lies on line ℓ_3
1 : $P_5 = (1, 1, 0, 0)$ lies on line ℓ_0
2 : $P_6 = (2, 1, 0, 0)$ lies on line ℓ_0
3 : $P_7 = (3, 1, 0, 0)$ lies on line ℓ_0
4 : $P_8 = (4, 1, 0, 0)$ lies on line ℓ_0
5 : $P_9 = (5, 1, 0, 0)$ lies on line ℓ_0
6 : $P_{10} = (6, 1, 0, 0)$ lies on line ℓ_0
7 : $P_{11} = (7, 1, 0, 0)$ lies on line ℓ_0
8 : $P_{12} = (8, 1, 0, 0)$ lies on line ℓ_0
9 : $P_{13} = (9, 1, 0, 0)$ lies on line ℓ_0
10 : $P_{14} = (10, 1, 0, 0)$ lies on line ℓ_0
11 : $P_{15} = (11, 1, 0, 0)$ lies on line ℓ_0
12 : $P_{16} = (12, 1, 0, 0)$ lies on line ℓ_0
13 : $P_{17} = (13, 1, 0, 0)$ lies on line ℓ_0
14 : $P_{18} = (14, 1, 0, 0)$ lies on line ℓ_0
15 : $P_{19} = (15, 1, 0, 0)$ lies on line ℓ_0
16 : $P_{20} = (16, 1, 0, 0)$ lies on line ℓ_0
17 : $P_{21} = (17, 1, 0, 0)$ lies on line ℓ_0
18 : $P_{22} = (18, 1, 0, 0)$ lies on line ℓ_0
19 : $P_{23} = (19, 1, 0, 0)$ lies on line ℓ_0
20 : $P_{24} = (20, 1, 0, 0)$ lies on line ℓ_0
21 : $P_{25} = (21, 1, 0, 0)$ lies on line ℓ_0

22 : $P_{26} = (22, 1, 0, 0)$ lies on line ℓ_0
23 : $P_{27} = (23, 1, 0, 0)$ lies on line ℓ_0
24 : $P_{28} = (24, 1, 0, 0)$ lies on line ℓ_0
25 : $P_{29} = (25, 1, 0, 0)$ lies on line ℓ_0
26 : $P_{30} = (26, 1, 0, 0)$ lies on line ℓ_0
27 : $P_{31} = (27, 1, 0, 0)$ lies on line ℓ_0
28 : $P_{32} = (28, 1, 0, 0)$ lies on line ℓ_0
29 : $P_{33} = (29, 1, 0, 0)$ lies on line ℓ_0
30 : $P_{34} = (30, 1, 0, 0)$ lies on line ℓ_0
31 : $P_{35} = (31, 1, 0, 0)$ lies on line ℓ_0
32 : $P_{36} = (32, 1, 0, 0)$ lies on line ℓ_0
33 : $P_{37} = (33, 1, 0, 0)$ lies on line ℓ_0
34 : $P_{38} = (34, 1, 0, 0)$ lies on line ℓ_0
35 : $P_{39} = (35, 1, 0, 0)$ lies on line ℓ_0
36 : $P_{40} = (36, 1, 0, 0)$ lies on line ℓ_0
37 : $P_{41} = (37, 1, 0, 0)$ lies on line ℓ_0
38 : $P_{42} = (38, 1, 0, 0)$ lies on line ℓ_0
39 : $P_{43} = (39, 1, 0, 0)$ lies on line ℓ_0
40 : $P_{44} = (40, 1, 0, 0)$ lies on line ℓ_0
41 : $P_{45} = (41, 1, 0, 0)$ lies on line ℓ_0
42 : $P_{46} = (42, 1, 0, 0)$ lies on line ℓ_0
43 : $P_{47} = (43, 1, 0, 0)$ lies on line ℓ_0

44 : $P_{48} = (44, 1, 0, 0)$ lies on line ℓ_0
 45 : $P_{49} = (45, 1, 0, 0)$ lies on line ℓ_0
 46 : $P_{50} = (46, 1, 0, 0)$ lies on line ℓ_0
 47 : $P_{51} = (47, 1, 0, 0)$ lies on line ℓ_0
 48 : $P_{52} = (48, 1, 0, 0)$ lies on line ℓ_0
 49 : $P_{53} = (49, 1, 0, 0)$ lies on line ℓ_0
 50 : $P_{54} = (50, 1, 0, 0)$ lies on line ℓ_0
 51 : $P_{55} = (51, 1, 0, 0)$ lies on line ℓ_0
 52 : $P_{56} = (52, 1, 0, 0)$ lies on line ℓ_0
 53 : $P_{57} = (53, 1, 0, 0)$ lies on line ℓ_0
 54 : $P_{58} = (54, 1, 0, 0)$ lies on line ℓ_0
 55 : $P_{59} = (55, 1, 0, 0)$ lies on line ℓ_0
 56 : $P_{60} = (56, 1, 0, 0)$ lies on line ℓ_0
 57 : $P_{61} = (57, 1, 0, 0)$ lies on line ℓ_0
 58 : $P_{62} = (58, 1, 0, 0)$ lies on line ℓ_0
 59 : $P_{63} = (59, 1, 0, 0)$ lies on line ℓ_0
 60 : $P_{64} = (60, 1, 0, 0)$ lies on line ℓ_0
 61 : $P_{65} = (61, 1, 0, 0)$ lies on line ℓ_0
 62 : $P_{66} = (62, 1, 0, 0)$ lies on line ℓ_0
 63 : $P_{67} = (63, 1, 0, 0)$ lies on line ℓ_0
 64 : $P_{68} = (1, 0, 1, 0)$ lies on line ℓ_1
 65 : $P_{69} = (2, 0, 1, 0)$ lies on line ℓ_1
 66 : $P_{70} = (3, 0, 1, 0)$ lies on line ℓ_1
 67 : $P_{71} = (4, 0, 1, 0)$ lies on line ℓ_1
 68 : $P_{72} = (5, 0, 1, 0)$ lies on line ℓ_1
 69 : $P_{73} = (6, 0, 1, 0)$ lies on line ℓ_1
 70 : $P_{74} = (7, 0, 1, 0)$ lies on line ℓ_1
 71 : $P_{75} = (8, 0, 1, 0)$ lies on line ℓ_1
 72 : $P_{76} = (9, 0, 1, 0)$ lies on line ℓ_1
 73 : $P_{77} = (10, 0, 1, 0)$ lies on line ℓ_1
 74 : $P_{78} = (11, 0, 1, 0)$ lies on line ℓ_1
 75 : $P_{79} = (12, 0, 1, 0)$ lies on line ℓ_1
 76 : $P_{80} = (13, 0, 1, 0)$ lies on line ℓ_1
 77 : $P_{81} = (14, 0, 1, 0)$ lies on line ℓ_1
 78 : $P_{82} = (15, 0, 1, 0)$ lies on line ℓ_1
 79 : $P_{83} = (16, 0, 1, 0)$ lies on line ℓ_1
 80 : $P_{84} = (17, 0, 1, 0)$ lies on line ℓ_1
 81 : $P_{85} = (18, 0, 1, 0)$ lies on line ℓ_1
 82 : $P_{86} = (19, 0, 1, 0)$ lies on line ℓ_1
 83 : $P_{87} = (20, 0, 1, 0)$ lies on line ℓ_1
 84 : $P_{88} = (21, 0, 1, 0)$ lies on line ℓ_1
 85 : $P_{89} = (22, 0, 1, 0)$ lies on line ℓ_1
 86 : $P_{90} = (23, 0, 1, 0)$ lies on line ℓ_1
 87 : $P_{91} = (24, 0, 1, 0)$ lies on line ℓ_1
 88 : $P_{92} = (25, 0, 1, 0)$ lies on line ℓ_1
 89 : $P_{93} = (26, 0, 1, 0)$ lies on line ℓ_1
 90 : $P_{94} = (27, 0, 1, 0)$ lies on line ℓ_1
 91 : $P_{95} = (28, 0, 1, 0)$ lies on line ℓ_1
 92 : $P_{96} = (29, 0, 1, 0)$ lies on line ℓ_1
 93 : $P_{97} = (30, 0, 1, 0)$ lies on line ℓ_1
 94 : $P_{98} = (31, 0, 1, 0)$ lies on line ℓ_1
 95 : $P_{99} = (32, 0, 1, 0)$ lies on line ℓ_1
 96 : $P_{100} = (33, 0, 1, 0)$ lies on line ℓ_1
 97 : $P_{101} = (34, 0, 1, 0)$ lies on line ℓ_1

98 : $P_{102} = (35, 0, 1, 0)$ lies on line ℓ_1
 99 : $P_{103} = (36, 0, 1, 0)$ lies on line ℓ_1
 100 : $P_{104} = (37, 0, 1, 0)$ lies on line ℓ_1
 101 : $P_{105} = (38, 0, 1, 0)$ lies on line ℓ_1
 102 : $P_{106} = (39, 0, 1, 0)$ lies on line ℓ_1
 103 : $P_{107} = (40, 0, 1, 0)$ lies on line ℓ_1
 104 : $P_{108} = (41, 0, 1, 0)$ lies on line ℓ_1
 105 : $P_{109} = (42, 0, 1, 0)$ lies on line ℓ_1
 106 : $P_{110} = (43, 0, 1, 0)$ lies on line ℓ_1
 107 : $P_{111} = (44, 0, 1, 0)$ lies on line ℓ_1
 108 : $P_{112} = (45, 0, 1, 0)$ lies on line ℓ_1
 109 : $P_{113} = (46, 0, 1, 0)$ lies on line ℓ_1
 110 : $P_{114} = (47, 0, 1, 0)$ lies on line ℓ_1
 111 : $P_{115} = (48, 0, 1, 0)$ lies on line ℓ_1
 112 : $P_{116} = (49, 0, 1, 0)$ lies on line ℓ_1
 113 : $P_{117} = (50, 0, 1, 0)$ lies on line ℓ_1
 114 : $P_{118} = (51, 0, 1, 0)$ lies on line ℓ_1
 115 : $P_{119} = (52, 0, 1, 0)$ lies on line ℓ_1
 116 : $P_{120} = (53, 0, 1, 0)$ lies on line ℓ_1
 117 : $P_{121} = (54, 0, 1, 0)$ lies on line ℓ_1
 118 : $P_{122} = (55, 0, 1, 0)$ lies on line ℓ_1
 119 : $P_{123} = (56, 0, 1, 0)$ lies on line ℓ_1
 120 : $P_{124} = (57, 0, 1, 0)$ lies on line ℓ_1
 121 : $P_{125} = (58, 0, 1, 0)$ lies on line ℓ_1
 122 : $P_{126} = (59, 0, 1, 0)$ lies on line ℓ_1
 123 : $P_{127} = (60, 0, 1, 0)$ lies on line ℓ_1
 124 : $P_{128} = (61, 0, 1, 0)$ lies on line ℓ_1
 125 : $P_{129} = (62, 0, 1, 0)$ lies on line ℓ_1
 126 : $P_{130} = (63, 0, 1, 0)$ lies on line ℓ_1
 127 : $P_{131} = (0, 1, 1, 0)$ lies on line ℓ_2
 128 : $P_{195} = (0, 2, 1, 0)$ lies on line ℓ_2
 129 : $P_{259} = (0, 3, 1, 0)$ lies on line ℓ_2
 130 : $P_{323} = (0, 4, 1, 0)$ lies on line ℓ_2
 131 : $P_{387} = (0, 5, 1, 0)$ lies on line ℓ_2
 132 : $P_{451} = (0, 6, 1, 0)$ lies on line ℓ_2
 133 : $P_{515} = (0, 7, 1, 0)$ lies on line ℓ_2
 134 : $P_{579} = (0, 8, 1, 0)$ lies on line ℓ_2
 135 : $P_{643} = (0, 9, 1, 0)$ lies on line ℓ_2
 136 : $P_{707} = (0, 10, 1, 0)$ lies on line ℓ_2
 137 : $P_{771} = (0, 11, 1, 0)$ lies on line ℓ_2
 138 : $P_{835} = (0, 12, 1, 0)$ lies on line ℓ_2
 139 : $P_{899} = (0, 13, 1, 0)$ lies on line ℓ_2
 140 : $P_{963} = (0, 14, 1, 0)$ lies on line ℓ_2
 141 : $P_{1027} = (0, 15, 1, 0)$ lies on line ℓ_2
 142 : $P_{1091} = (0, 16, 1, 0)$ lies on line ℓ_2
 143 : $P_{1155} = (0, 17, 1, 0)$ lies on line ℓ_2
 144 : $P_{1219} = (0, 18, 1, 0)$ lies on line ℓ_2
 145 : $P_{1283} = (0, 19, 1, 0)$ lies on line ℓ_2
 146 : $P_{1347} = (0, 20, 1, 0)$ lies on line ℓ_2
 147 : $P_{1411} = (0, 21, 1, 0)$ lies on line ℓ_2
 148 : $P_{1475} = (0, 22, 1, 0)$ lies on line ℓ_2
 149 : $P_{1539} = (0, 23, 1, 0)$ lies on line ℓ_2
 150 : $P_{1603} = (0, 24, 1, 0)$ lies on line ℓ_2
 151 : $P_{1667} = (0, 25, 1, 0)$ lies on line ℓ_2

152 : $P_{1731} = (0, 26, 1, 0)$ lies on line ℓ_2	203 : $P_{61505} = (0, 0, 14, 1)$ lies on line ℓ_3
153 : $P_{1795} = (0, 27, 1, 0)$ lies on line ℓ_2	204 : $P_{65601} = (0, 0, 15, 1)$ lies on line ℓ_3
154 : $P_{1859} = (0, 28, 1, 0)$ lies on line ℓ_2	205 : $P_{69697} = (0, 0, 16, 1)$ lies on line ℓ_3
155 : $P_{1923} = (0, 29, 1, 0)$ lies on line ℓ_2	206 : $P_{73793} = (0, 0, 17, 1)$ lies on line ℓ_3
156 : $P_{1987} = (0, 30, 1, 0)$ lies on line ℓ_2	207 : $P_{77889} = (0, 0, 18, 1)$ lies on line ℓ_3
157 : $P_{2051} = (0, 31, 1, 0)$ lies on line ℓ_2	208 : $P_{81985} = (0, 0, 19, 1)$ lies on line ℓ_3
158 : $P_{2115} = (0, 32, 1, 0)$ lies on line ℓ_2	209 : $P_{86081} = (0, 0, 20, 1)$ lies on line ℓ_3
159 : $P_{2179} = (0, 33, 1, 0)$ lies on line ℓ_2	210 : $P_{90177} = (0, 0, 21, 1)$ lies on line ℓ_3
160 : $P_{2243} = (0, 34, 1, 0)$ lies on line ℓ_2	211 : $P_{94273} = (0, 0, 22, 1)$ lies on line ℓ_3
161 : $P_{2307} = (0, 35, 1, 0)$ lies on line ℓ_2	212 : $P_{98369} = (0, 0, 23, 1)$ lies on line ℓ_3
162 : $P_{2371} = (0, 36, 1, 0)$ lies on line ℓ_2	213 : $P_{102465} = (0, 0, 24, 1)$ lies on line ℓ_3
163 : $P_{2435} = (0, 37, 1, 0)$ lies on line ℓ_2	214 : $P_{106561} = (0, 0, 25, 1)$ lies on line ℓ_3
164 : $P_{2499} = (0, 38, 1, 0)$ lies on line ℓ_2	215 : $P_{110657} = (0, 0, 26, 1)$ lies on line ℓ_3
165 : $P_{2563} = (0, 39, 1, 0)$ lies on line ℓ_2	216 : $P_{114753} = (0, 0, 27, 1)$ lies on line ℓ_3
166 : $P_{2627} = (0, 40, 1, 0)$ lies on line ℓ_2	217 : $P_{118849} = (0, 0, 28, 1)$ lies on line ℓ_3
167 : $P_{2691} = (0, 41, 1, 0)$ lies on line ℓ_2	218 : $P_{122945} = (0, 0, 29, 1)$ lies on line ℓ_3
168 : $P_{2755} = (0, 42, 1, 0)$ lies on line ℓ_2	219 : $P_{127041} = (0, 0, 30, 1)$ lies on line ℓ_3
169 : $P_{2819} = (0, 43, 1, 0)$ lies on line ℓ_2	220 : $P_{131137} = (0, 0, 31, 1)$ lies on line ℓ_3
170 : $P_{2883} = (0, 44, 1, 0)$ lies on line ℓ_2	221 : $P_{135233} = (0, 0, 32, 1)$ lies on line ℓ_3
171 : $P_{2947} = (0, 45, 1, 0)$ lies on line ℓ_2	222 : $P_{139329} = (0, 0, 33, 1)$ lies on line ℓ_3
172 : $P_{3011} = (0, 46, 1, 0)$ lies on line ℓ_2	223 : $P_{143425} = (0, 0, 34, 1)$ lies on line ℓ_3
173 : $P_{3075} = (0, 47, 1, 0)$ lies on line ℓ_2	224 : $P_{147521} = (0, 0, 35, 1)$ lies on line ℓ_3
174 : $P_{3139} = (0, 48, 1, 0)$ lies on line ℓ_2	225 : $P_{151617} = (0, 0, 36, 1)$ lies on line ℓ_3
175 : $P_{3203} = (0, 49, 1, 0)$ lies on line ℓ_2	226 : $P_{155713} = (0, 0, 37, 1)$ lies on line ℓ_3
176 : $P_{3267} = (0, 50, 1, 0)$ lies on line ℓ_2	227 : $P_{159809} = (0, 0, 38, 1)$ lies on line ℓ_3
177 : $P_{3331} = (0, 51, 1, 0)$ lies on line ℓ_2	228 : $P_{163905} = (0, 0, 39, 1)$ lies on line ℓ_3
178 : $P_{3395} = (0, 52, 1, 0)$ lies on line ℓ_2	229 : $P_{168001} = (0, 0, 40, 1)$ lies on line ℓ_3
179 : $P_{3459} = (0, 53, 1, 0)$ lies on line ℓ_2	230 : $P_{172097} = (0, 0, 41, 1)$ lies on line ℓ_3
180 : $P_{3523} = (0, 54, 1, 0)$ lies on line ℓ_2	231 : $P_{176193} = (0, 0, 42, 1)$ lies on line ℓ_3
181 : $P_{3587} = (0, 55, 1, 0)$ lies on line ℓ_2	232 : $P_{180289} = (0, 0, 43, 1)$ lies on line ℓ_3
182 : $P_{3651} = (0, 56, 1, 0)$ lies on line ℓ_2	233 : $P_{184385} = (0, 0, 44, 1)$ lies on line ℓ_3
183 : $P_{3715} = (0, 57, 1, 0)$ lies on line ℓ_2	234 : $P_{188481} = (0, 0, 45, 1)$ lies on line ℓ_3
184 : $P_{3779} = (0, 58, 1, 0)$ lies on line ℓ_2	235 : $P_{192577} = (0, 0, 46, 1)$ lies on line ℓ_3
185 : $P_{3843} = (0, 59, 1, 0)$ lies on line ℓ_2	236 : $P_{196673} = (0, 0, 47, 1)$ lies on line ℓ_3
186 : $P_{3907} = (0, 60, 1, 0)$ lies on line ℓ_2	237 : $P_{200769} = (0, 0, 48, 1)$ lies on line ℓ_3
187 : $P_{3971} = (0, 61, 1, 0)$ lies on line ℓ_2	238 : $P_{204865} = (0, 0, 49, 1)$ lies on line ℓ_3
188 : $P_{4035} = (0, 62, 1, 0)$ lies on line ℓ_2	239 : $P_{208961} = (0, 0, 50, 1)$ lies on line ℓ_3
189 : $P_{4099} = (0, 63, 1, 0)$ lies on line ℓ_2	240 : $P_{213057} = (0, 0, 51, 1)$ lies on line ℓ_3
190 : $P_{8258} = (0, 0, 1, 1)$ lies on line ℓ_3	241 : $P_{217153} = (0, 0, 52, 1)$ lies on line ℓ_3
191 : $P_{12353} = (0, 0, 2, 1)$ lies on line ℓ_3	242 : $P_{221249} = (0, 0, 53, 1)$ lies on line ℓ_3
192 : $P_{16449} = (0, 0, 3, 1)$ lies on line ℓ_3	243 : $P_{225345} = (0, 0, 54, 1)$ lies on line ℓ_3
193 : $P_{20545} = (0, 0, 4, 1)$ lies on line ℓ_3	244 : $P_{229441} = (0, 0, 55, 1)$ lies on line ℓ_3
194 : $P_{24641} = (0, 0, 5, 1)$ lies on line ℓ_3	245 : $P_{233537} = (0, 0, 56, 1)$ lies on line ℓ_3
195 : $P_{28737} = (0, 0, 6, 1)$ lies on line ℓ_3	246 : $P_{237633} = (0, 0, 57, 1)$ lies on line ℓ_3
196 : $P_{32833} = (0, 0, 7, 1)$ lies on line ℓ_3	247 : $P_{241729} = (0, 0, 58, 1)$ lies on line ℓ_3
197 : $P_{36929} = (0, 0, 8, 1)$ lies on line ℓ_3	248 : $P_{245825} = (0, 0, 59, 1)$ lies on line ℓ_3
198 : $P_{41025} = (0, 0, 9, 1)$ lies on line ℓ_3	249 : $P_{249921} = (0, 0, 60, 1)$ lies on line ℓ_3
199 : $P_{45121} = (0, 0, 10, 1)$ lies on line ℓ_3	250 : $P_{254017} = (0, 0, 61, 1)$ lies on line ℓ_3
200 : $P_{49217} = (0, 0, 11, 1)$ lies on line ℓ_3	251 : $P_{258113} = (0, 0, 62, 1)$ lies on line ℓ_3
201 : $P_{53313} = (0, 0, 12, 1)$ lies on line ℓ_3	252 : $P_{262209} = (0, 0, 63, 1)$ lies on line ℓ_3
202 : $P_{57409} = (0, 0, 13, 1)$ lies on line ℓ_3	

The single points on the surface are:

Points on surface but on no line

The surface has 3969 points not on any line:
Too many to print.

Line Intersection Graph

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

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_1	ℓ_2
in point	P_0	P_1

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3
in point	P_0	P_2	P_2

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_3
in point	P_1	P_2	P_2

Line 3 intersects

Line	ℓ_1	ℓ_2
in point	P_2	P_2

The surface has 4225 points:

Too many to print.