

# Rank-65903 over GF(64)

January 15, 2021

## The equation

The equation of the surface is :

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

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

The point rank of the equation over GF(64) is -2130173883

## General information

Number of lines	4
Number of points	4161
Number of singular points	2
Number of Eckardt points	0
Number of double points	4
Number of single points	252
Number of points off lines	3905
Number of Hesse planes	0
Number of axes	0
Type of points on lines	$65^4$
Type of lines on points	$2^4, 1^{252}, 0^{3905}$

## Singular Points

The surface has 2 singular points:

$$\begin{aligned} 0 : P_{7747} &= \mathbf{P}(1, \epsilon^{42}, 0, 1) = \mathbf{P}(1, 56, 0, 1) \\ 1 : P_{7811} &= \mathbf{P}(1, \epsilon^{21}, 0, 1) = \mathbf{P}(1, 57, 0, 1) \end{aligned}$$

## The 4 Lines

The lines and their Pluecker coordinates are:

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

$$\begin{aligned}\ell_1 &= \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{4097} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{4097} = \mathbf{Pl}(0, 0, 1, 0, 1, 0)_{4352} \\ \ell_2 &= \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{266304} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \end{bmatrix}_{266304} = \mathbf{Pl}(1, 0, 0, 1, 0, 0)_{130} \\ \ell_3 &= \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{8258} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{8258} = \mathbf{Pl}(0, 0, 1, 1, 1, 1)_{544578}\end{aligned}$$

Rank of lines: ( 0, 4097, 266304, 8258 )

Rank of points on Klein quadric: ( 0, 4352, 130, 544578 )

### Eckardt Points

The surface has 0 Eckardt points:

### Double Points

The surface has 4 Double points:

The double points on the surface are:

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

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

$$P_5 = (1, 1, 0, 0) = \ell_0 \cap \ell_3$$

$$P_{8258} = (0, 0, 1, 1) = \ell_1 \cap \ell_3$$

### Single Points

The surface has 252 single points:

The single points on the surface are:

0 :  $P_4 = (1, 1, 1, 1)$  lies on line  $\ell_3$   
1 :  $P_6 = (2, 1, 0, 0)$  lies on line  $\ell_0$   
2 :  $P_7 = (3, 1, 0, 0)$  lies on line  $\ell_0$   
3 :  $P_8 = (4, 1, 0, 0)$  lies on line  $\ell_0$   
4 :  $P_9 = (5, 1, 0, 0)$  lies on line  $\ell_0$   
5 :  $P_{10} = (6, 1, 0, 0)$  lies on line  $\ell_0$   
6 :  $P_{11} = (7, 1, 0, 0)$  lies on line  $\ell_0$   
7 :  $P_{12} = (8, 1, 0, 0)$  lies on line  $\ell_0$   
8 :  $P_{13} = (9, 1, 0, 0)$  lies on line  $\ell_0$   
9 :  $P_{14} = (10, 1, 0, 0)$  lies on line  $\ell_0$   
10 :  $P_{15} = (11, 1, 0, 0)$  lies on line  $\ell_0$   
11 :  $P_{16} = (12, 1, 0, 0)$  lies on line  $\ell_0$   
12 :  $P_{17} = (13, 1, 0, 0)$  lies on line  $\ell_0$   
13 :  $P_{18} = (14, 1, 0, 0)$  lies on line  $\ell_0$   
14 :  $P_{19} = (15, 1, 0, 0)$  lies on line  $\ell_0$   
15 :  $P_{20} = (16, 1, 0, 0)$  lies on line  $\ell_0$   
16 :  $P_{21} = (17, 1, 0, 0)$  lies on line  $\ell_0$   
17 :  $P_{22} = (18, 1, 0, 0)$  lies on line  $\ell_0$   
18 :  $P_{23} = (19, 1, 0, 0)$  lies on line  $\ell_0$   
19 :  $P_{24} = (20, 1, 0, 0)$  lies on line  $\ell_0$   
20 :  $P_{25} = (21, 1, 0, 0)$  lies on line  $\ell_0$   
21 :  $P_{26} = (22, 1, 0, 0)$  lies on line  $\ell_0$

22 :  $P_{27} = (23, 1, 0, 0)$  lies on line  $\ell_0$   
23 :  $P_{28} = (24, 1, 0, 0)$  lies on line  $\ell_0$   
24 :  $P_{29} = (25, 1, 0, 0)$  lies on line  $\ell_0$   
25 :  $P_{30} = (26, 1, 0, 0)$  lies on line  $\ell_0$   
26 :  $P_{31} = (27, 1, 0, 0)$  lies on line  $\ell_0$   
27 :  $P_{32} = (28, 1, 0, 0)$  lies on line  $\ell_0$   
28 :  $P_{33} = (29, 1, 0, 0)$  lies on line  $\ell_0$   
29 :  $P_{34} = (30, 1, 0, 0)$  lies on line  $\ell_0$   
30 :  $P_{35} = (31, 1, 0, 0)$  lies on line  $\ell_0$   
31 :  $P_{36} = (32, 1, 0, 0)$  lies on line  $\ell_0$   
32 :  $P_{37} = (33, 1, 0, 0)$  lies on line  $\ell_0$   
33 :  $P_{38} = (34, 1, 0, 0)$  lies on line  $\ell_0$   
34 :  $P_{39} = (35, 1, 0, 0)$  lies on line  $\ell_0$   
35 :  $P_{40} = (36, 1, 0, 0)$  lies on line  $\ell_0$   
36 :  $P_{41} = (37, 1, 0, 0)$  lies on line  $\ell_0$   
37 :  $P_{42} = (38, 1, 0, 0)$  lies on line  $\ell_0$   
38 :  $P_{43} = (39, 1, 0, 0)$  lies on line  $\ell_0$   
39 :  $P_{44} = (40, 1, 0, 0)$  lies on line  $\ell_0$   
40 :  $P_{45} = (41, 1, 0, 0)$  lies on line  $\ell_0$   
41 :  $P_{46} = (42, 1, 0, 0)$  lies on line  $\ell_0$   
42 :  $P_{47} = (43, 1, 0, 0)$  lies on line  $\ell_0$   
43 :  $P_{48} = (44, 1, 0, 0)$  lies on line  $\ell_0$

44 :  $P_{49} = (45, 1, 0, 0)$  lies on line  $\ell_0$   
 45 :  $P_{50} = (46, 1, 0, 0)$  lies on line  $\ell_0$   
 46 :  $P_{51} = (47, 1, 0, 0)$  lies on line  $\ell_0$   
 47 :  $P_{52} = (48, 1, 0, 0)$  lies on line  $\ell_0$   
 48 :  $P_{53} = (49, 1, 0, 0)$  lies on line  $\ell_0$   
 49 :  $P_{54} = (50, 1, 0, 0)$  lies on line  $\ell_0$   
 50 :  $P_{55} = (51, 1, 0, 0)$  lies on line  $\ell_0$   
 51 :  $P_{56} = (52, 1, 0, 0)$  lies on line  $\ell_0$   
 52 :  $P_{57} = (53, 1, 0, 0)$  lies on line  $\ell_0$   
 53 :  $P_{58} = (54, 1, 0, 0)$  lies on line  $\ell_0$   
 54 :  $P_{59} = (55, 1, 0, 0)$  lies on line  $\ell_0$   
 55 :  $P_{60} = (56, 1, 0, 0)$  lies on line  $\ell_0$   
 56 :  $P_{61} = (57, 1, 0, 0)$  lies on line  $\ell_0$   
 57 :  $P_{62} = (58, 1, 0, 0)$  lies on line  $\ell_0$   
 58 :  $P_{63} = (59, 1, 0, 0)$  lies on line  $\ell_0$   
 59 :  $P_{64} = (60, 1, 0, 0)$  lies on line  $\ell_0$   
 60 :  $P_{65} = (61, 1, 0, 0)$  lies on line  $\ell_0$   
 61 :  $P_{66} = (62, 1, 0, 0)$  lies on line  $\ell_0$   
 62 :  $P_{67} = (63, 1, 0, 0)$  lies on line  $\ell_0$   
 63 :  $P_{4163} = (1, 0, 0, 1)$  lies on line  $\ell_2$   
 64 :  $P_{4227} = (1, 1, 0, 1)$  lies on line  $\ell_2$   
 65 :  $P_{4291} = (1, 2, 0, 1)$  lies on line  $\ell_2$   
 66 :  $P_{4355} = (1, 3, 0, 1)$  lies on line  $\ell_2$   
 67 :  $P_{4419} = (1, 4, 0, 1)$  lies on line  $\ell_2$   
 68 :  $P_{4483} = (1, 5, 0, 1)$  lies on line  $\ell_2$   
 69 :  $P_{4547} = (1, 6, 0, 1)$  lies on line  $\ell_2$   
 70 :  $P_{4611} = (1, 7, 0, 1)$  lies on line  $\ell_2$   
 71 :  $P_{4675} = (1, 8, 0, 1)$  lies on line  $\ell_2$   
 72 :  $P_{4739} = (1, 9, 0, 1)$  lies on line  $\ell_2$   
 73 :  $P_{4803} = (1, 10, 0, 1)$  lies on line  $\ell_2$   
 74 :  $P_{4867} = (1, 11, 0, 1)$  lies on line  $\ell_2$   
 75 :  $P_{4931} = (1, 12, 0, 1)$  lies on line  $\ell_2$   
 76 :  $P_{4995} = (1, 13, 0, 1)$  lies on line  $\ell_2$   
 77 :  $P_{5059} = (1, 14, 0, 1)$  lies on line  $\ell_2$   
 78 :  $P_{5123} = (1, 15, 0, 1)$  lies on line  $\ell_2$   
 79 :  $P_{5187} = (1, 16, 0, 1)$  lies on line  $\ell_2$   
 80 :  $P_{5251} = (1, 17, 0, 1)$  lies on line  $\ell_2$   
 81 :  $P_{5315} = (1, 18, 0, 1)$  lies on line  $\ell_2$   
 82 :  $P_{5379} = (1, 19, 0, 1)$  lies on line  $\ell_2$   
 83 :  $P_{5443} = (1, 20, 0, 1)$  lies on line  $\ell_2$   
 84 :  $P_{5507} = (1, 21, 0, 1)$  lies on line  $\ell_2$   
 85 :  $P_{5571} = (1, 22, 0, 1)$  lies on line  $\ell_2$   
 86 :  $P_{5635} = (1, 23, 0, 1)$  lies on line  $\ell_2$   
 87 :  $P_{5699} = (1, 24, 0, 1)$  lies on line  $\ell_2$   
 88 :  $P_{5763} = (1, 25, 0, 1)$  lies on line  $\ell_2$   
 89 :  $P_{5827} = (1, 26, 0, 1)$  lies on line  $\ell_2$   
 90 :  $P_{5891} = (1, 27, 0, 1)$  lies on line  $\ell_2$   
 91 :  $P_{5955} = (1, 28, 0, 1)$  lies on line  $\ell_2$   
 92 :  $P_{6019} = (1, 29, 0, 1)$  lies on line  $\ell_2$   
 93 :  $P_{6083} = (1, 30, 0, 1)$  lies on line  $\ell_2$   
 94 :  $P_{6147} = (1, 31, 0, 1)$  lies on line  $\ell_2$   
 95 :  $P_{6211} = (1, 32, 0, 1)$  lies on line  $\ell_2$   
 96 :  $P_{6275} = (1, 33, 0, 1)$  lies on line  $\ell_2$   
 97 :  $P_{6339} = (1, 34, 0, 1)$  lies on line  $\ell_2$

98 :  $P_{6403} = (1, 35, 0, 1)$  lies on line  $\ell_2$   
 99 :  $P_{6467} = (1, 36, 0, 1)$  lies on line  $\ell_2$   
 100 :  $P_{6531} = (1, 37, 0, 1)$  lies on line  $\ell_2$   
 101 :  $P_{6595} = (1, 38, 0, 1)$  lies on line  $\ell_2$   
 102 :  $P_{6659} = (1, 39, 0, 1)$  lies on line  $\ell_2$   
 103 :  $P_{6723} = (1, 40, 0, 1)$  lies on line  $\ell_2$   
 104 :  $P_{6787} = (1, 41, 0, 1)$  lies on line  $\ell_2$   
 105 :  $P_{6851} = (1, 42, 0, 1)$  lies on line  $\ell_2$   
 106 :  $P_{6915} = (1, 43, 0, 1)$  lies on line  $\ell_2$   
 107 :  $P_{6979} = (1, 44, 0, 1)$  lies on line  $\ell_2$   
 108 :  $P_{7043} = (1, 45, 0, 1)$  lies on line  $\ell_2$   
 109 :  $P_{7107} = (1, 46, 0, 1)$  lies on line  $\ell_2$   
 110 :  $P_{7171} = (1, 47, 0, 1)$  lies on line  $\ell_2$   
 111 :  $P_{7235} = (1, 48, 0, 1)$  lies on line  $\ell_2$   
 112 :  $P_{7299} = (1, 49, 0, 1)$  lies on line  $\ell_2$   
 113 :  $P_{7363} = (1, 50, 0, 1)$  lies on line  $\ell_2$   
 114 :  $P_{7427} = (1, 51, 0, 1)$  lies on line  $\ell_2$   
 115 :  $P_{7491} = (1, 52, 0, 1)$  lies on line  $\ell_2$   
 116 :  $P_{7555} = (1, 53, 0, 1)$  lies on line  $\ell_2$   
 117 :  $P_{7619} = (1, 54, 0, 1)$  lies on line  $\ell_2$   
 118 :  $P_{7683} = (1, 55, 0, 1)$  lies on line  $\ell_2$   
 119 :  $P_{7747} = (1, 56, 0, 1)$  lies on line  $\ell_2$   
 120 :  $P_{7811} = (1, 57, 0, 1)$  lies on line  $\ell_2$   
 121 :  $P_{7875} = (1, 58, 0, 1)$  lies on line  $\ell_2$   
 122 :  $P_{7939} = (1, 59, 0, 1)$  lies on line  $\ell_2$   
 123 :  $P_{8003} = (1, 60, 0, 1)$  lies on line  $\ell_2$   
 124 :  $P_{8067} = (1, 61, 0, 1)$  lies on line  $\ell_2$   
 125 :  $P_{8131} = (1, 62, 0, 1)$  lies on line  $\ell_2$   
 126 :  $P_{8195} = (1, 63, 0, 1)$  lies on line  $\ell_2$   
 127 :  $P_{8259} = (1, 0, 1, 1)$  lies on line  $\ell_1$   
 128 :  $P_{8260} = (2, 0, 1, 1)$  lies on line  $\ell_1$   
 129 :  $P_{8261} = (3, 0, 1, 1)$  lies on line  $\ell_1$   
 130 :  $P_{8262} = (4, 0, 1, 1)$  lies on line  $\ell_1$   
 131 :  $P_{8263} = (5, 0, 1, 1)$  lies on line  $\ell_1$   
 132 :  $P_{8264} = (6, 0, 1, 1)$  lies on line  $\ell_1$   
 133 :  $P_{8265} = (7, 0, 1, 1)$  lies on line  $\ell_1$   
 134 :  $P_{8266} = (8, 0, 1, 1)$  lies on line  $\ell_1$   
 135 :  $P_{8267} = (9, 0, 1, 1)$  lies on line  $\ell_1$   
 136 :  $P_{8268} = (10, 0, 1, 1)$  lies on line  $\ell_1$   
 137 :  $P_{8269} = (11, 0, 1, 1)$  lies on line  $\ell_1$   
 138 :  $P_{8270} = (12, 0, 1, 1)$  lies on line  $\ell_1$   
 139 :  $P_{8271} = (13, 0, 1, 1)$  lies on line  $\ell_1$   
 140 :  $P_{8272} = (14, 0, 1, 1)$  lies on line  $\ell_1$   
 141 :  $P_{8273} = (15, 0, 1, 1)$  lies on line  $\ell_1$   
 142 :  $P_{8274} = (16, 0, 1, 1)$  lies on line  $\ell_1$   
 143 :  $P_{8275} = (17, 0, 1, 1)$  lies on line  $\ell_1$   
 144 :  $P_{8276} = (18, 0, 1, 1)$  lies on line  $\ell_1$   
 145 :  $P_{8277} = (19, 0, 1, 1)$  lies on line  $\ell_1$   
 146 :  $P_{8278} = (20, 0, 1, 1)$  lies on line  $\ell_1$   
 147 :  $P_{8279} = (21, 0, 1, 1)$  lies on line  $\ell_1$   
 148 :  $P_{8280} = (22, 0, 1, 1)$  lies on line  $\ell_1$   
 149 :  $P_{8281} = (23, 0, 1, 1)$  lies on line  $\ell_1$   
 150 :  $P_{8282} = (24, 0, 1, 1)$  lies on line  $\ell_1$   
 151 :  $P_{8283} = (25, 0, 1, 1)$  lies on line  $\ell_1$

152 :  $P_{8284} = (26, 0, 1, 1)$  lies on line  $\ell_1$   
 153 :  $P_{8285} = (27, 0, 1, 1)$  lies on line  $\ell_1$   
 154 :  $P_{8286} = (28, 0, 1, 1)$  lies on line  $\ell_1$   
 155 :  $P_{8287} = (29, 0, 1, 1)$  lies on line  $\ell_1$   
 156 :  $P_{8288} = (30, 0, 1, 1)$  lies on line  $\ell_1$   
 157 :  $P_{8289} = (31, 0, 1, 1)$  lies on line  $\ell_1$   
 158 :  $P_{8290} = (32, 0, 1, 1)$  lies on line  $\ell_1$   
 159 :  $P_{8291} = (33, 0, 1, 1)$  lies on line  $\ell_1$   
 160 :  $P_{8292} = (34, 0, 1, 1)$  lies on line  $\ell_1$   
 161 :  $P_{8293} = (35, 0, 1, 1)$  lies on line  $\ell_1$   
 162 :  $P_{8294} = (36, 0, 1, 1)$  lies on line  $\ell_1$   
 163 :  $P_{8295} = (37, 0, 1, 1)$  lies on line  $\ell_1$   
 164 :  $P_{8296} = (38, 0, 1, 1)$  lies on line  $\ell_1$   
 165 :  $P_{8297} = (39, 0, 1, 1)$  lies on line  $\ell_1$   
 166 :  $P_{8298} = (40, 0, 1, 1)$  lies on line  $\ell_1$   
 167 :  $P_{8299} = (41, 0, 1, 1)$  lies on line  $\ell_1$   
 168 :  $P_{8300} = (42, 0, 1, 1)$  lies on line  $\ell_1$   
 169 :  $P_{8301} = (43, 0, 1, 1)$  lies on line  $\ell_1$   
 170 :  $P_{8302} = (44, 0, 1, 1)$  lies on line  $\ell_1$   
 171 :  $P_{8303} = (45, 0, 1, 1)$  lies on line  $\ell_1$   
 172 :  $P_{8304} = (46, 0, 1, 1)$  lies on line  $\ell_1$   
 173 :  $P_{8305} = (47, 0, 1, 1)$  lies on line  $\ell_1$   
 174 :  $P_{8306} = (48, 0, 1, 1)$  lies on line  $\ell_1$   
 175 :  $P_{8307} = (49, 0, 1, 1)$  lies on line  $\ell_1$   
 176 :  $P_{8308} = (50, 0, 1, 1)$  lies on line  $\ell_1$   
 177 :  $P_{8309} = (51, 0, 1, 1)$  lies on line  $\ell_1$   
 178 :  $P_{8310} = (52, 0, 1, 1)$  lies on line  $\ell_1$   
 179 :  $P_{8311} = (53, 0, 1, 1)$  lies on line  $\ell_1$   
 180 :  $P_{8312} = (54, 0, 1, 1)$  lies on line  $\ell_1$   
 181 :  $P_{8313} = (55, 0, 1, 1)$  lies on line  $\ell_1$   
 182 :  $P_{8314} = (56, 0, 1, 1)$  lies on line  $\ell_1$   
 183 :  $P_{8315} = (57, 0, 1, 1)$  lies on line  $\ell_1$   
 184 :  $P_{8316} = (58, 0, 1, 1)$  lies on line  $\ell_1$   
 185 :  $P_{8317} = (59, 0, 1, 1)$  lies on line  $\ell_1$   
 186 :  $P_{8318} = (60, 0, 1, 1)$  lies on line  $\ell_1$   
 187 :  $P_{8319} = (61, 0, 1, 1)$  lies on line  $\ell_1$   
 188 :  $P_{8320} = (62, 0, 1, 1)$  lies on line  $\ell_1$   
 189 :  $P_{8321} = (63, 0, 1, 1)$  lies on line  $\ell_1$   
 190 :  $P_{8387} = (2, 2, 1, 1)$  lies on line  $\ell_3$   
 191 :  $P_{8452} = (3, 3, 1, 1)$  lies on line  $\ell_3$   
 192 :  $P_{8517} = (4, 4, 1, 1)$  lies on line  $\ell_3$   
 193 :  $P_{8582} = (5, 5, 1, 1)$  lies on line  $\ell_3$   
 194 :  $P_{8647} = (6, 6, 1, 1)$  lies on line  $\ell_3$   
 195 :  $P_{8712} = (7, 7, 1, 1)$  lies on line  $\ell_3$   
 196 :  $P_{8777} = (8, 8, 1, 1)$  lies on line  $\ell_3$   
 197 :  $P_{8842} = (9, 9, 1, 1)$  lies on line  $\ell_3$   
 198 :  $P_{8907} = (10, 10, 1, 1)$  lies on line  $\ell_3$   
 199 :  $P_{8972} = (11, 11, 1, 1)$  lies on line  $\ell_3$   
 200 :  $P_{9037} = (12, 12, 1, 1)$  lies on line  $\ell_3$   
 201 :  $P_{9102} = (13, 13, 1, 1)$  lies on line  $\ell_3$   
 202 :  $P_{9167} = (14, 14, 1, 1)$  lies on line  $\ell_3$

203 :  $P_{9232} = (15, 15, 1, 1)$  lies on line  $\ell_3$   
 204 :  $P_{9297} = (16, 16, 1, 1)$  lies on line  $\ell_3$   
 205 :  $P_{9362} = (17, 17, 1, 1)$  lies on line  $\ell_3$   
 206 :  $P_{9427} = (18, 18, 1, 1)$  lies on line  $\ell_3$   
 207 :  $P_{9492} = (19, 19, 1, 1)$  lies on line  $\ell_3$   
 208 :  $P_{9557} = (20, 20, 1, 1)$  lies on line  $\ell_3$   
 209 :  $P_{9622} = (21, 21, 1, 1)$  lies on line  $\ell_3$   
 210 :  $P_{9687} = (22, 22, 1, 1)$  lies on line  $\ell_3$   
 211 :  $P_{9752} = (23, 23, 1, 1)$  lies on line  $\ell_3$   
 212 :  $P_{9817} = (24, 24, 1, 1)$  lies on line  $\ell_3$   
 213 :  $P_{9882} = (25, 25, 1, 1)$  lies on line  $\ell_3$   
 214 :  $P_{9947} = (26, 26, 1, 1)$  lies on line  $\ell_3$   
 215 :  $P_{10012} = (27, 27, 1, 1)$  lies on line  $\ell_3$   
 216 :  $P_{10077} = (28, 28, 1, 1)$  lies on line  $\ell_3$   
 217 :  $P_{10142} = (29, 29, 1, 1)$  lies on line  $\ell_3$   
 218 :  $P_{10207} = (30, 30, 1, 1)$  lies on line  $\ell_3$   
 219 :  $P_{10272} = (31, 31, 1, 1)$  lies on line  $\ell_3$   
 220 :  $P_{10337} = (32, 32, 1, 1)$  lies on line  $\ell_3$   
 221 :  $P_{10402} = (33, 33, 1, 1)$  lies on line  $\ell_3$   
 222 :  $P_{10467} = (34, 34, 1, 1)$  lies on line  $\ell_3$   
 223 :  $P_{10532} = (35, 35, 1, 1)$  lies on line  $\ell_3$   
 224 :  $P_{10597} = (36, 36, 1, 1)$  lies on line  $\ell_3$   
 225 :  $P_{10662} = (37, 37, 1, 1)$  lies on line  $\ell_3$   
 226 :  $P_{10727} = (38, 38, 1, 1)$  lies on line  $\ell_3$   
 227 :  $P_{10792} = (39, 39, 1, 1)$  lies on line  $\ell_3$   
 228 :  $P_{10857} = (40, 40, 1, 1)$  lies on line  $\ell_3$   
 229 :  $P_{10922} = (41, 41, 1, 1)$  lies on line  $\ell_3$   
 230 :  $P_{10987} = (42, 42, 1, 1)$  lies on line  $\ell_3$   
 231 :  $P_{11052} = (43, 43, 1, 1)$  lies on line  $\ell_3$   
 232 :  $P_{11117} = (44, 44, 1, 1)$  lies on line  $\ell_3$   
 233 :  $P_{11182} = (45, 45, 1, 1)$  lies on line  $\ell_3$   
 234 :  $P_{11247} = (46, 46, 1, 1)$  lies on line  $\ell_3$   
 235 :  $P_{11312} = (47, 47, 1, 1)$  lies on line  $\ell_3$   
 236 :  $P_{11377} = (48, 48, 1, 1)$  lies on line  $\ell_3$   
 237 :  $P_{11442} = (49, 49, 1, 1)$  lies on line  $\ell_3$   
 238 :  $P_{11507} = (50, 50, 1, 1)$  lies on line  $\ell_3$   
 239 :  $P_{11572} = (51, 51, 1, 1)$  lies on line  $\ell_3$   
 240 :  $P_{11637} = (52, 52, 1, 1)$  lies on line  $\ell_3$   
 241 :  $P_{11702} = (53, 53, 1, 1)$  lies on line  $\ell_3$   
 242 :  $P_{11767} = (54, 54, 1, 1)$  lies on line  $\ell_3$   
 243 :  $P_{11832} = (55, 55, 1, 1)$  lies on line  $\ell_3$   
 244 :  $P_{11897} = (56, 56, 1, 1)$  lies on line  $\ell_3$   
 245 :  $P_{11962} = (57, 57, 1, 1)$  lies on line  $\ell_3$   
 246 :  $P_{12027} = (58, 58, 1, 1)$  lies on line  $\ell_3$   
 247 :  $P_{12092} = (59, 59, 1, 1)$  lies on line  $\ell_3$   
 248 :  $P_{12157} = (60, 60, 1, 1)$  lies on line  $\ell_3$   
 249 :  $P_{12222} = (61, 61, 1, 1)$  lies on line  $\ell_3$   
 250 :  $P_{12287} = (62, 62, 1, 1)$  lies on line  $\ell_3$   
 251 :  $P_{12352} = (63, 63, 1, 1)$  lies on line  $\ell_3$

The single points on the surface are:

### Points on surface but on no line

The surface has 3905 points not on any line:  
Too many to print.

### Line Intersection Graph

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

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	$\ell_1$	$\ell_2$	$\ell_3$
in point	$P_0$	$P_1$	$P_5$

Line 1 intersects

Line	$\ell_0$	$\ell_3$
in point	$P_0$	$P_{8258}$

Line 2 intersects

Line	$\ell_0$
in point	$P_1$

Line 3 intersects

Line	$\ell_0$	$\ell_1$
in point	$P_5$	$P_{8258}$

The surface has 4161 points:  
Too many to print.