

# Rank-74007 over GF(64)

January 15, 2021

## The equation

The equation of the surface is :

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

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

The point rank of the equation over GF(64) is 1107566661

## General information

Number of lines	5
Number of points	4225
Number of singular points	3
Number of Eckardt points	1
Number of double points	4
Number of single points	314
Number of points off lines	3906
Number of Hesse planes	0
Number of axes	0
Type of points on lines	$65^5$
Type of lines on points	$3, 2^4, 1^{314}, 0^{3906}$

## Singular Points

The surface has 3 singular points:

$$0 : P_{8322} = \mathbf{P}(0, 1, 1, 1) = \mathbf{P}(0, 1, 1, 1)$$

$$2 : P_{241274} = \mathbf{P}(\epsilon^{21}, \epsilon^{42}, \epsilon^{21}, 1) = \mathbf{P}(57, 56, 57, 1)$$

$$1 : P_{237241} = \mathbf{P}(\epsilon^{42}, \epsilon^{21}, \epsilon^{42}, 1) = \mathbf{P}(56, 57, 56, 1)$$

## The 5 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \left[ \begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right]_{17043520} = \left[ \begin{array}{cccc} 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 1 \end{array} \right]_{17043520} = \mathbf{P}\mathbf{l}(0, 0, 0, 1, 0, 0)_{129}$$

$$\begin{aligned}
\ell_1 &= \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043585} = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17043585} = \mathbf{Pl}(0, 1, 0, 1, 0, 0)_{193} \\
\ell_2 &= \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{270529} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{270529} = \mathbf{Pl}(1, 1, 0, 1, 1, 1)_{540609} \\
\ell_3 &= \begin{bmatrix} 1 & 0 & \epsilon^{42} & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{499385} = \begin{bmatrix} 1 & 0 & 56 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{499385} = \mathbf{Pl}(57, 56, 56, 57, 57, 1)_{15447410} \\
\ell_4 &= \begin{bmatrix} 1 & 0 & \epsilon^{21} & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{503546} = \begin{bmatrix} 1 & 0 & 57 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{503546} = \mathbf{Pl}(56, 57, 57, 56, 56, 1)_{15189172}
\end{aligned}$$

Rank of lines: ( 17043520, 17043585, 270529, 499385, 503546 )

Rank of points on Klein quadric: ( 129, 193, 540609, 15447410, 15189172 )

### Eckardt Points

The surface has 1 Eckardt points:

$$0 : P_{8322} = \mathbf{P}(0, 1, 1, 1) = \mathbf{P}(0, 1, 1, 1).$$

### Double Points

The surface has 4 Double points:

The double points on the surface are:

$$P_3 = (0, 0, 0, 1) = \ell_0 \cap \ell_1$$

$$P_{4226} = (0, 1, 0, 1) = \ell_0 \cap \ell_2$$

$$P_{241274} = (57, 56, 57, 1) = \ell_2 \cap \ell_3$$

$$P_{237241} = (56, 57, 56, 1) = \ell_2 \cap \ell_4$$

### Single Points

The surface has 314 single points:

The single points on the surface are:

$$0 : P_1 = (0, 1, 0, 0) \text{ lies on line } \ell_0$$

$$1 : P_{131} = (0, 1, 1, 0) \text{ lies on line } \ell_1$$

$$2 : P_{132} = (1, 1, 1, 0) \text{ lies on line } \ell_2$$

$$3 : P_{3707} = (56, 56, 1, 0) \text{ lies on line } \ell_3$$

$$4 : P_{3772} = (57, 57, 1, 0) \text{ lies on line } \ell_4$$

$$5 : P_{4290} = (0, 2, 0, 1) \text{ lies on line } \ell_0$$

$$6 : P_{4354} = (0, 3, 0, 1) \text{ lies on line } \ell_0$$

$$7 : P_{4418} = (0, 4, 0, 1) \text{ lies on line } \ell_0$$

$$8 : P_{4482} = (0, 5, 0, 1) \text{ lies on line } \ell_0$$

$$9 : P_{4546} = (0, 6, 0, 1) \text{ lies on line } \ell_0$$

$$10 : P_{4610} = (0, 7, 0, 1) \text{ lies on line } \ell_0$$

$$11 : P_{4674} = (0, 8, 0, 1) \text{ lies on line } \ell_0$$

$$12 : P_{4738} = (0, 9, 0, 1) \text{ lies on line } \ell_0$$

$$13 : P_{4802} = (0, 10, 0, 1) \text{ lies on line } \ell_0$$

$$14 : P_{4866} = (0, 11, 0, 1) \text{ lies on line } \ell_0$$

$$15 : P_{4930} = (0, 12, 0, 1) \text{ lies on line } \ell_0$$

$$16 : P_{4994} = (0, 13, 0, 1) \text{ lies on line } \ell_0$$

$$17 : P_{5058} = (0, 14, 0, 1) \text{ lies on line } \ell_0$$

$$18 : P_{5122} = (0, 15, 0, 1) \text{ lies on line } \ell_0$$

$$19 : P_{5186} = (0, 16, 0, 1) \text{ lies on line } \ell_0$$

$$20 : P_{5250} = (0, 17, 0, 1) \text{ lies on line } \ell_0$$

$$21 : P_{5314} = (0, 18, 0, 1) \text{ lies on line } \ell_0$$

$$22 : P_{5378} = (0, 19, 0, 1) \text{ lies on line } \ell_0$$

$$23 : P_{5442} = (0, 20, 0, 1) \text{ lies on line } \ell_0$$

$$24 : P_{5506} = (0, 21, 0, 1) \text{ lies on line } \ell_0$$

$$25 : P_{5570} = (0, 22, 0, 1) \text{ lies on line } \ell_0$$

$$26 : P_{5634} = (0, 23, 0, 1) \text{ lies on line } \ell_0$$

$$27 : P_{5698} = (0, 24, 0, 1) \text{ lies on line } \ell_0$$

$$28 : P_{5762} = (0, 25, 0, 1) \text{ lies on line } \ell_0$$

$$29 : P_{5826} = (0, 26, 0, 1) \text{ lies on line } \ell_0$$

$$30 : P_{5890} = (0, 27, 0, 1) \text{ lies on line } \ell_0$$

$$31 : P_{5954} = (0, 28, 0, 1) \text{ lies on line } \ell_0$$

$$32 : P_{6018} = (0, 29, 0, 1) \text{ lies on line } \ell_0$$

$$33 : P_{6082} = (0, 30, 0, 1) \text{ lies on line } \ell_0$$

$$34 : P_{6146} = (0, 31, 0, 1) \text{ lies on line } \ell_0$$

$$35 : P_{6210} = (0, 32, 0, 1) \text{ lies on line } \ell_0$$

- 36 :  $P_{6274} = (0, 33, 0, 1)$  lies on line  $\ell_0$   
 37 :  $P_{6338} = (0, 34, 0, 1)$  lies on line  $\ell_0$   
 38 :  $P_{6402} = (0, 35, 0, 1)$  lies on line  $\ell_0$   
 39 :  $P_{6466} = (0, 36, 0, 1)$  lies on line  $\ell_0$   
 40 :  $P_{6530} = (0, 37, 0, 1)$  lies on line  $\ell_0$   
 41 :  $P_{6594} = (0, 38, 0, 1)$  lies on line  $\ell_0$   
 42 :  $P_{6658} = (0, 39, 0, 1)$  lies on line  $\ell_0$   
 43 :  $P_{6722} = (0, 40, 0, 1)$  lies on line  $\ell_0$   
 44 :  $P_{6786} = (0, 41, 0, 1)$  lies on line  $\ell_0$   
 45 :  $P_{6850} = (0, 42, 0, 1)$  lies on line  $\ell_0$   
 46 :  $P_{6914} = (0, 43, 0, 1)$  lies on line  $\ell_0$   
 47 :  $P_{6978} = (0, 44, 0, 1)$  lies on line  $\ell_0$   
 48 :  $P_{7042} = (0, 45, 0, 1)$  lies on line  $\ell_0$   
 49 :  $P_{7106} = (0, 46, 0, 1)$  lies on line  $\ell_0$   
 50 :  $P_{7170} = (0, 47, 0, 1)$  lies on line  $\ell_0$   
 51 :  $P_{7234} = (0, 48, 0, 1)$  lies on line  $\ell_0$   
 52 :  $P_{7298} = (0, 49, 0, 1)$  lies on line  $\ell_0$   
 53 :  $P_{7362} = (0, 50, 0, 1)$  lies on line  $\ell_0$   
 54 :  $P_{7426} = (0, 51, 0, 1)$  lies on line  $\ell_0$   
 55 :  $P_{7490} = (0, 52, 0, 1)$  lies on line  $\ell_0$   
 56 :  $P_{7554} = (0, 53, 0, 1)$  lies on line  $\ell_0$   
 57 :  $P_{7618} = (0, 54, 0, 1)$  lies on line  $\ell_0$   
 58 :  $P_{7682} = (0, 55, 0, 1)$  lies on line  $\ell_0$   
 59 :  $P_{7746} = (0, 56, 0, 1)$  lies on line  $\ell_0$   
 60 :  $P_{7803} = (57, 56, 0, 1)$  lies on line  $\ell_4$   
 61 :  $P_{7810} = (0, 57, 0, 1)$  lies on line  $\ell_0$   
 62 :  $P_{7866} = (56, 57, 0, 1)$  lies on line  $\ell_3$   
 63 :  $P_{7874} = (0, 58, 0, 1)$  lies on line  $\ell_0$   
 64 :  $P_{7938} = (0, 59, 0, 1)$  lies on line  $\ell_0$   
 65 :  $P_{8002} = (0, 60, 0, 1)$  lies on line  $\ell_0$   
 66 :  $P_{8066} = (0, 61, 0, 1)$  lies on line  $\ell_0$   
 67 :  $P_{8130} = (0, 62, 0, 1)$  lies on line  $\ell_0$   
 68 :  $P_{8194} = (0, 63, 0, 1)$  lies on line  $\ell_0$   
 69 :  $P_{8259} = (1, 0, 1, 1)$  lies on line  $\ell_2$   
 70 :  $P_{12481} = (0, 2, 2, 1)$  lies on line  $\ell_1$   
 71 :  $P_{12547} = (2, 3, 2, 1)$  lies on line  $\ell_2$   
 72 :  $P_{14954} = (41, 40, 2, 1)$  lies on line  $\ell_3$   
 73 :  $P_{15147} = (42, 43, 2, 1)$  lies on line  $\ell_4$   
 74 :  $P_{16580} = (3, 2, 3, 1)$  lies on line  $\ell_2$   
 75 :  $P_{16641} = (0, 3, 3, 1)$  lies on line  $\ell_1$   
 76 :  $P_{17490} = (17, 16, 3, 1)$  lies on line  $\ell_3$   
 77 :  $P_{17620} = (19, 18, 3, 1)$  lies on line  $\ell_4$   
 78 :  $P_{20801} = (0, 4, 4, 1)$  lies on line  $\ell_1$   
 79 :  $P_{20869} = (4, 5, 4, 1)$  lies on line  $\ell_2$   
 80 :  $P_{22299} = (26, 27, 4, 1)$  lies on line  $\ell_3$   
 81 :  $P_{22496} = (31, 30, 4, 1)$  lies on line  $\ell_4$   
 82 :  $P_{24902} = (5, 4, 5, 1)$  lies on line  $\ell_2$   
 83 :  $P_{24961} = (0, 5, 5, 1)$  lies on line  $\ell_1$   
 84 :  $P_{26915} = (34, 35, 5, 1)$  lies on line  $\ell_3$   
 85 :  $P_{27175} = (38, 39, 5, 1)$  lies on line  $\ell_4$   
 86 :  $P_{29121} = (0, 6, 6, 1)$  lies on line  $\ell_1$   
 87 :  $P_{29191} = (6, 7, 6, 1)$  lies on line  $\ell_2$   
 88 :  $P_{29388} = (11, 10, 6, 1)$  lies on line  $\ell_3$   
 89 :  $P_{29581} = (12, 13, 6, 1)$  lies on line  $\ell_4$   
 90 :  $P_{33224} = (7, 6, 7, 1)$  lies on line  $\ell_2$   
 91 :  $P_{33281} = (0, 7, 7, 1)$  lies on line  $\ell_1$   
 92 :  $P_{36084} = (51, 50, 7, 1)$  lies on line  $\ell_3$   
 93 :  $P_{36214} = (53, 52, 7, 1)$  lies on line  $\ell_4$   
 94 :  $P_{37441} = (0, 8, 8, 1)$  lies on line  $\ell_1$   
 95 :  $P_{37513} = (8, 9, 8, 1)$  lies on line  $\ell_2$   
 96 :  $P_{38293} = (20, 21, 8, 1)$  lies on line  $\ell_4$   
 97 :  $P_{38750} = (29, 28, 8, 1)$  lies on line  $\ell_3$   
 98 :  $P_{41546} = (9, 8, 9, 1)$  lies on line  $\ell_2$   
 99 :  $P_{41601} = (0, 9, 9, 1)$  lies on line  $\ell_1$   
 100 :  $P_{43366} = (37, 36, 9, 1)$  lies on line  $\ell_3$   
 101 :  $P_{43886} = (45, 44, 9, 1)$  lies on line  $\ell_4$   
 102 :  $P_{45512} = (7, 6, 10, 1)$  lies on line  $\ell_4$   
 103 :  $P_{45761} = (0, 10, 10, 1)$  lies on line  $\ell_1$   
 104 :  $P_{45835} = (10, 11, 10, 1)$  lies on line  $\ell_2$   
 105 :  $P_{45965} = (12, 13, 10, 1)$  lies on line  $\ell_3$   
 106 :  $P_{49868} = (11, 10, 11, 1)$  lies on line  $\ell_2$   
 107 :  $P_{49921} = (0, 11, 11, 1)$  lies on line  $\ell_1$   
 108 :  $P_{52661} = (52, 53, 11, 1)$  lies on line  $\ell_3$   
 109 :  $P_{53311} = (62, 63, 11, 1)$  lies on line  $\ell_4$   
 110 :  $P_{54081} = (0, 12, 12, 1)$  lies on line  $\ell_1$   
 111 :  $P_{54157} = (12, 13, 12, 1)$  lies on line  $\ell_2$   
 112 :  $P_{56627} = (50, 51, 12, 1)$  lies on line  $\ell_4$   
 113 :  $P_{57344} = (63, 62, 12, 1)$  lies on line  $\ell_3$   
 114 :  $P_{57800} = (7, 6, 13, 1)$  lies on line  $\ell_3$   
 115 :  $P_{58060} = (11, 10, 13, 1)$  lies on line  $\ell_4$   
 116 :  $P_{58190} = (13, 12, 13, 1)$  lies on line  $\ell_2$   
 117 :  $P_{58241} = (0, 13, 13, 1)$  lies on line  $\ell_1$   
 118 :  $P_{62401} = (0, 14, 14, 1)$  lies on line  $\ell_1$   
 119 :  $P_{62479} = (14, 15, 14, 1)$  lies on line  $\ell_2$   
 120 :  $P_{63586} = (33, 32, 14, 1)$  lies on line  $\ell_4$   
 121 :  $P_{64559} = (46, 47, 14, 1)$  lies on line  $\ell_3$   
 122 :  $P_{66512} = (15, 14, 15, 1)$  lies on line  $\ell_2$   
 123 :  $P_{66561} = (0, 15, 15, 1)$  lies on line  $\ell_1$   
 124 :  $P_{67095} = (22, 23, 15, 1)$  lies on line  $\ell_3$   
 125 :  $P_{67225} = (24, 25, 15, 1)$  lies on line  $\ell_4$   
 126 :  $P_{69891} = (2, 3, 16, 1)$  lies on line  $\ell_4$   
 127 :  $P_{70721} = (0, 16, 16, 1)$  lies on line  $\ell_1$   
 128 :  $P_{70801} = (16, 17, 16, 1)$  lies on line  $\ell_2$   
 129 :  $P_{70868} = (19, 18, 16, 1)$  lies on line  $\ell_3$   
 130 :  $P_{74834} = (17, 16, 17, 1)$  lies on line  $\ell_2$   
 131 :  $P_{74881} = (0, 17, 17, 1)$  lies on line  $\ell_1$   
 132 :  $P_{76524} = (43, 42, 17, 1)$  lies on line  $\ell_3$   
 133 :  $P_{77564} = (59, 58, 17, 1)$  lies on line  $\ell_4$   
 134 :  $P_{78083} = (2, 3, 18, 1)$  lies on line  $\ell_3$   
 135 :  $P_{78930} = (17, 16, 18, 1)$  lies on line  $\ell_4$   
 136 :  $P_{79041} = (0, 18, 18, 1)$  lies on line  $\ell_1$   
 137 :  $P_{79123} = (18, 19, 18, 1)$  lies on line  $\ell_2$   
 138 :  $P_{83156} = (19, 18, 19, 1)$  lies on line  $\ell_2$   
 139 :  $P_{83201} = (0, 19, 19, 1)$  lies on line  $\ell_1$   
 140 :  $P_{84649} = (40, 41, 19, 1)$  lies on line  $\ell_4$   
 141 :  $P_{85819} = (58, 59, 19, 1)$  lies on line  $\ell_3$   
 142 :  $P_{87361} = (0, 20, 20, 1)$  lies on line  $\ell_1$   
 143 :  $P_{87445} = (20, 21, 20, 1)$  lies on line  $\ell_2$

144 :  $P_{88485} = (36, 37, 20, 1)$  lies on line  $\ell_4$   
 145 :  $P_{89202} = (49, 48, 20, 1)$  lies on line  $\ell_3$   
 146 :  $P_{90698} = (9, 8, 21, 1)$  lies on line  $\ell_3$   
 147 :  $P_{91478} = (21, 20, 21, 1)$  lies on line  $\ell_2$   
 148 :  $P_{91521} = (0, 21, 21, 1)$  lies on line  $\ell_1$   
 149 :  $P_{91998} = (29, 28, 21, 1)$  lies on line  $\ell_4$   
 150 :  $P_{95681} = (0, 22, 22, 1)$  lies on line  $\ell_1$   
 151 :  $P_{95767} = (22, 23, 22, 1)$  lies on line  $\ell_2$   
 152 :  $P_{96417} = (32, 33, 22, 1)$  lies on line  $\ell_3$   
 153 :  $P_{97784} = (55, 54, 22, 1)$  lies on line  $\ell_4$   
 154 :  $P_{99343} = (14, 15, 23, 1)$  lies on line  $\ell_4$   
 155 :  $P_{99800} = (23, 22, 23, 1)$  lies on line  $\ell_2$   
 156 :  $P_{99841} = (0, 23, 23, 1)$  lies on line  $\ell_1$   
 157 :  $P_{99993} = (24, 25, 23, 1)$  lies on line  $\ell_3$   
 158 :  $P_{104001} = (0, 24, 24, 1)$  lies on line  $\ell_1$   
 159 :  $P_{104089} = (24, 25, 24, 1)$  lies on line  $\ell_2$   
 160 :  $P_{105456} = (47, 46, 24, 1)$  lies on line  $\ell_4$   
 161 :  $P_{106039} = (54, 55, 24, 1)$  lies on line  $\ell_3$   
 162 :  $P_{107535} = (14, 15, 25, 1)$  lies on line  $\ell_3$   
 163 :  $P_{108055} = (22, 23, 25, 1)$  lies on line  $\ell_4$   
 164 :  $P_{108122} = (25, 24, 25, 1)$  lies on line  $\ell_2$   
 165 :  $P_{108161} = (0, 25, 25, 1)$  lies on line  $\ell_1$   
 166 :  $P_{112321} = (0, 26, 26, 1)$  lies on line  $\ell_1$   
 167 :  $P_{112411} = (26, 27, 26, 1)$  lies on line  $\ell_2$   
 168 :  $P_{113128} = (39, 38, 26, 1)$  lies on line  $\ell_3$   
 169 :  $P_{114621} = (60, 61, 26, 1)$  lies on line  $\ell_4$   
 170 :  $P_{115014} = (5, 4, 27, 1)$  lies on line  $\ell_4$   
 171 :  $P_{116444} = (27, 26, 27, 1)$  lies on line  $\ell_2$   
 172 :  $P_{116481} = (0, 27, 27, 1)$  lies on line  $\ell_1$   
 173 :  $P_{116704} = (31, 30, 27, 1)$  lies on line  $\ell_3$   
 174 :  $P_{119370} = (9, 8, 28, 1)$  lies on line  $\ell_4$   
 175 :  $P_{120213} = (20, 21, 28, 1)$  lies on line  $\ell_3$   
 176 :  $P_{120641} = (0, 28, 28, 1)$  lies on line  $\ell_1$   
 177 :  $P_{120733} = (28, 29, 28, 1)$  lies on line  $\ell_2$   
 178 :  $P_{124766} = (29, 28, 29, 1)$  lies on line  $\ell_2$   
 179 :  $P_{124801} = (0, 29, 29, 1)$  lies on line  $\ell_1$   
 180 :  $P_{125869} = (44, 45, 29, 1)$  lies on line  $\ell_3$   
 181 :  $P_{126129} = (48, 49, 29, 1)$  lies on line  $\ell_4$   
 182 :  $P_{127302} = (5, 4, 30, 1)$  lies on line  $\ell_3$   
 183 :  $P_{128795} = (26, 27, 30, 1)$  lies on line  $\ell_4$   
 184 :  $P_{128961} = (0, 30, 30, 1)$  lies on line  $\ell_1$   
 185 :  $P_{129055} = (30, 31, 30, 1)$  lies on line  $\ell_2$   
 186 :  $P_{133088} = (31, 30, 31, 1)$  lies on line  $\ell_2$   
 187 :  $P_{133121} = (0, 31, 31, 1)$  lies on line  $\ell_1$   
 188 :  $P_{133348} = (35, 34, 31, 1)$  lies on line  $\ell_4$   
 189 :  $P_{135038} = (61, 60, 31, 1)$  lies on line  $\ell_3$   
 190 :  $P_{136144} = (15, 14, 32, 1)$  lies on line  $\ell_3$   
 191 :  $P_{137281} = (0, 32, 32, 1)$  lies on line  $\ell_1$   
 192 :  $P_{137377} = (32, 33, 32, 1)$  lies on line  $\ell_2$   
 193 :  $P_{138287} = (46, 47, 32, 1)$  lies on line  $\ell_4$   
 194 :  $P_{140760} = (23, 22, 33, 1)$  lies on line  $\ell_4$   
 195 :  $P_{141410} = (33, 32, 33, 1)$  lies on line  $\ell_2$   
 196 :  $P_{141441} = (0, 33, 33, 1)$  lies on line  $\ell_1$   
 197 :  $P_{142840} = (55, 54, 33, 1)$  lies on line  $\ell_3$   
 198 :  $P_{145439} = (30, 31, 34, 1)$  lies on line  $\ell_3$   
 199 :  $P_{145601} = (0, 34, 34, 1)$  lies on line  $\ell_1$   
 200 :  $P_{145699} = (34, 35, 34, 1)$  lies on line  $\ell_2$   
 201 :  $P_{147326} = (61, 60, 34, 1)$  lies on line  $\ell_4$   
 202 :  $P_{147845} = (4, 5, 35, 1)$  lies on line  $\ell_4$   
 203 :  $P_{149732} = (35, 34, 35, 1)$  lies on line  $\ell_2$   
 204 :  $P_{149761} = (0, 35, 35, 1)$  lies on line  $\ell_1$   
 205 :  $P_{150055} = (38, 39, 35, 1)$  lies on line  $\ell_3$   
 206 :  $P_{152201} = (8, 9, 36, 1)$  lies on line  $\ell_4$   
 207 :  $P_{153921} = (0, 36, 36, 1)$  lies on line  $\ell_1$   
 208 :  $P_{154021} = (36, 37, 36, 1)$  lies on line  $\ell_2$   
 209 :  $P_{154478} = (45, 44, 36, 1)$  lies on line  $\ell_3$   
 210 :  $P_{157014} = (21, 20, 37, 1)$  lies on line  $\ell_3$   
 211 :  $P_{158054} = (37, 36, 37, 1)$  lies on line  $\ell_2$   
 212 :  $P_{158081} = (0, 37, 37, 1)$  lies on line  $\ell_1$   
 213 :  $P_{158834} = (49, 48, 37, 1)$  lies on line  $\ell_4$   
 214 :  $P_{161500} = (27, 26, 38, 1)$  lies on line  $\ell_4$   
 215 :  $P_{162241} = (0, 38, 38, 1)$  lies on line  $\ell_1$   
 216 :  $P_{162343} = (38, 39, 38, 1)$  lies on line  $\ell_2$   
 217 :  $P_{163773} = (60, 61, 38, 1)$  lies on line  $\ell_3$   
 218 :  $P_{164229} = (4, 5, 39, 1)$  lies on line  $\ell_3$   
 219 :  $P_{166179} = (34, 35, 39, 1)$  lies on line  $\ell_4$   
 220 :  $P_{166376} = (39, 38, 39, 1)$  lies on line  $\ell_2$   
 221 :  $P_{166401} = (0, 39, 39, 1)$  lies on line  $\ell_1$   
 222 :  $P_{168132} = (3, 2, 40, 1)$  lies on line  $\ell_4$   
 223 :  $P_{170561} = (0, 40, 40, 1)$  lies on line  $\ell_1$   
 224 :  $P_{170665} = (40, 41, 40, 1)$  lies on line  $\ell_2$   
 225 :  $P_{170795} = (42, 43, 40, 1)$  lies on line  $\ell_3$   
 226 :  $P_{173331} = (18, 19, 41, 1)$  lies on line  $\ell_3$   
 227 :  $P_{174698} = (41, 40, 41, 1)$  lies on line  $\ell_2$   
 228 :  $P_{174721} = (0, 41, 41, 1)$  lies on line  $\ell_1$   
 229 :  $P_{175931} = (58, 59, 41, 1)$  lies on line  $\ell_4$   
 230 :  $P_{177297} = (16, 17, 42, 1)$  lies on line  $\ell_4$   
 231 :  $P_{178881} = (0, 42, 42, 1)$  lies on line  $\ell_1$   
 232 :  $P_{178987} = (42, 43, 42, 1)$  lies on line  $\ell_2$   
 233 :  $P_{179964} = (59, 58, 42, 1)$  lies on line  $\ell_3$   
 234 :  $P_{180420} = (3, 2, 43, 1)$  lies on line  $\ell_3$   
 235 :  $P_{182890} = (41, 40, 43, 1)$  lies on line  $\ell_4$   
 236 :  $P_{183020} = (43, 42, 43, 1)$  lies on line  $\ell_2$   
 237 :  $P_{183041} = (0, 43, 43, 1)$  lies on line  $\ell_1$   
 238 :  $P_{184969} = (8, 9, 44, 1)$  lies on line  $\ell_3$   
 239 :  $P_{186726} = (37, 36, 44, 1)$  lies on line  $\ell_4$   
 240 :  $P_{187201} = (0, 44, 44, 1)$  lies on line  $\ell_1$   
 241 :  $P_{187309} = (44, 45, 44, 1)$  lies on line  $\ell_2$   
 242 :  $P_{190365} = (28, 29, 45, 1)$  lies on line  $\ell_4$   
 243 :  $P_{191342} = (45, 44, 45, 1)$  lies on line  $\ell_2$   
 244 :  $P_{191361} = (0, 45, 45, 1)$  lies on line  $\ell_1$   
 245 :  $P_{191665} = (48, 49, 45, 1)$  lies on line  $\ell_3$   
 246 :  $P_{194138} = (25, 24, 46, 1)$  lies on line  $\ell_3$   
 247 :  $P_{195521} = (0, 46, 46, 1)$  lies on line  $\ell_1$   
 248 :  $P_{195631} = (46, 47, 46, 1)$  lies on line  $\ell_2$   
 249 :  $P_{196151} = (54, 55, 46, 1)$  lies on line  $\ell_4$   
 250 :  $P_{197584} = (15, 14, 47, 1)$  lies on line  $\ell_4$   
 251 :  $P_{198754} = (33, 32, 47, 1)$  lies on line  $\ell_3$

252 :  $P_{199664} = (47, 46, 47, 1)$  lies on line  $\ell_2$   
 253 :  $P_{199681} = (0, 47, 47, 1)$  lies on line  $\ell_1$   
 254 :  $P_{202070} = (21, 20, 48, 1)$  lies on line  $\ell_4$   
 255 :  $P_{203173} = (36, 37, 48, 1)$  lies on line  $\ell_3$   
 256 :  $P_{203841} = (0, 48, 48, 1)$  lies on line  $\ell_1$   
 257 :  $P_{203953} = (48, 49, 48, 1)$  lies on line  $\ell_2$   
 258 :  $P_{206749} = (28, 29, 49, 1)$  lies on line  $\ell_3$   
 259 :  $P_{207789} = (44, 45, 49, 1)$  lies on line  $\ell_4$   
 260 :  $P_{207986} = (49, 48, 49, 1)$  lies on line  $\ell_2$   
 261 :  $P_{208001} = (0, 49, 49, 1)$  lies on line  $\ell_1$   
 262 :  $P_{209415} = (6, 7, 50, 1)$  lies on line  $\ell_4$   
 263 :  $P_{212161} = (0, 50, 50, 1)$  lies on line  $\ell_1$   
 264 :  $P_{212275} = (50, 51, 50, 1)$  lies on line  $\ell_2$   
 265 :  $P_{212342} = (53, 52, 50, 1)$  lies on line  $\ell_3$   
 266 :  $P_{213838} = (13, 12, 51, 1)$  lies on line  $\ell_3$   
 267 :  $P_{216308} = (51, 50, 51, 1)$  lies on line  $\ell_2$   
 268 :  $P_{216321} = (0, 51, 51, 1)$  lies on line  $\ell_1$   
 269 :  $P_{217088} = (63, 62, 51, 1)$  lies on line  $\ell_4$   
 270 :  $P_{217607} = (6, 7, 52, 1)$  lies on line  $\ell_3$   
 271 :  $P_{220404} = (51, 50, 52, 1)$  lies on line  $\ell_4$   
 272 :  $P_{220481} = (0, 52, 52, 1)$  lies on line  $\ell_1$   
 273 :  $P_{220597} = (52, 53, 52, 1)$  lies on line  $\ell_2$   
 274 :  $P_{221963} = (10, 11, 53, 1)$  lies on line  $\ell_4$   
 275 :  $P_{224630} = (53, 52, 53, 1)$  lies on line  $\ell_2$   
 276 :  $P_{224641} = (0, 53, 53, 1)$  lies on line  $\ell_1$   
 277 :  $P_{225343} = (62, 63, 53, 1)$  lies on line  $\ell_3$   
 278 :  $P_{226776} = (23, 22, 54, 1)$  lies on line  $\ell_3$   
 279 :  $P_{227489} = (32, 33, 54, 1)$  lies on line  $\ell_4$   
 280 :  $P_{228801} = (0, 54, 54, 1)$  lies on line  $\ell_1$   
 281 :  $P_{228919} = (54, 55, 54, 1)$  lies on line  $\ell_2$   
 282 :  $P_{231002} = (25, 24, 55, 1)$  lies on line  $\ell_4$   
 283 :  $P_{232432} = (47, 46, 55, 1)$  lies on line  $\ell_3$   
 284 :  $P_{232952} = (55, 54, 55, 1)$  lies on line  $\ell_2$   
 285 :  $P_{232961} = (0, 55, 55, 1)$  lies on line  $\ell_1$   
 286 :  $P_{233538} = (1, 0, 56, 1)$  lies on line  $\ell_3$   
 287 :  $P_{237121} = (0, 56, 56, 1)$  lies on line  $\ell_1$   
 288 :  $P_{237634} = (1, 0, 57, 1)$  lies on line  $\ell_4$   
 289 :  $P_{241281} = (0, 57, 57, 1)$  lies on line  $\ell_1$   
 290 :  $P_{242833} = (16, 17, 58, 1)$  lies on line  $\ell_3$   
 291 :  $P_{244460} = (43, 42, 58, 1)$  lies on line  $\ell_4$   
 292 :  $P_{245441} = (0, 58, 58, 1)$  lies on line  $\ell_1$   
 293 :  $P_{245563} = (58, 59, 58, 1)$  lies on line  $\ell_2$   
 294 :  $P_{247059} = (18, 19, 59, 1)$  lies on line  $\ell_4$   
 295 :  $P_{248489} = (40, 41, 59, 1)$  lies on line  $\ell_3$   
 296 :  $P_{249596} = (59, 58, 59, 1)$  lies on line  $\ell_2$   
 297 :  $P_{249601} = (0, 59, 59, 1)$  lies on line  $\ell_1$   
 298 :  $P_{251935} = (30, 31, 60, 1)$  lies on line  $\ell_4$   
 299 :  $P_{252132} = (35, 34, 60, 1)$  lies on line  $\ell_3$   
 300 :  $P_{253761} = (0, 60, 60, 1)$  lies on line  $\ell_1$   
 301 :  $P_{253885} = (60, 61, 60, 1)$  lies on line  $\ell_2$   
 302 :  $P_{255708} = (27, 26, 61, 1)$  lies on line  $\ell_3$   
 303 :  $P_{256488} = (39, 38, 61, 1)$  lies on line  $\ell_4$   
 304 :  $P_{257918} = (61, 60, 61, 1)$  lies on line  $\ell_2$   
 305 :  $P_{257921} = (0, 61, 61, 1)$  lies on line  $\ell_1$   
 306 :  $P_{258894} = (13, 12, 62, 1)$  lies on line  $\ell_4$   
 307 :  $P_{261427} = (50, 51, 62, 1)$  lies on line  $\ell_3$   
 308 :  $P_{262081} = (0, 62, 62, 1)$  lies on line  $\ell_1$   
 309 :  $P_{262207} = (62, 63, 62, 1)$  lies on line  $\ell_2$   
 310 :  $P_{262923} = (10, 11, 63, 1)$  lies on line  $\ell_3$   
 311 :  $P_{265653} = (52, 53, 63, 1)$  lies on line  $\ell_4$   
 312 :  $P_{266240} = (63, 62, 63, 1)$  lies on line  $\ell_2$   
 313 :  $P_{266241} = (0, 63, 63, 1)$  lies on line  $\ell_1$

The single points on the surface are:

### Points on surface but on no line

The surface has 3906 points not on any line:  
Too many to print.

### Line Intersection Graph

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

Neighbor sets in the line intersection graph:  
Line 0 intersects

Line	$\ell_1$	$\ell_2$
in point	$P_3$	$P_{4226}$

Line 1 intersects

Line	$\ell_0$	$\ell_3$	$\ell_4$
in point	$P_3$	$P_{8322}$	$P_{8322}$

Line 2 intersects

Line	$\ell_0$	$\ell_3$	$\ell_4$
in point	$P_{4226}$	$P_{241274}$	$P_{237241}$

Line 3 intersects

Line	$\ell_1$	$\ell_2$	$\ell_4$
in point	$P_{8322}$	$P_{241274}$	$P_{8322}$

Line 4 intersects

Line	$\ell_1$	$\ell_2$	$\ell_3$
in point	$P_{8322}$	$P_{237241}$	$P_{8322}$

The surface has 4225 points:  
Too many to print.