

Rank-65839 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 0, 1, 1, 0, 1, 0, 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	7
Number of points	4289
Number of singular points	2
Number of Eckardt points	0
Number of double points	3
Number of single points	441
Number of points off lines	3843
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^7
Type of lines on points	$4^2, 2^3, 1^{441}, 0^{3843}$

Singular Points

The surface has 2 singular points:

$$\begin{aligned} 0 : P_{60} &= \mathbf{P}(\epsilon^{42}, 1, 0, 0) = \mathbf{P}(56, 1, 0, 0) \\ 1 : P_{61} &= \mathbf{P}(\epsilon^{21}, 1, 0, 0) = \mathbf{P}(57, 1, 0, 0) \end{aligned}$$

The 7 Lines

The lines and their Pluecker coordinates are:

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

$$\begin{aligned}
\ell_1 &= \begin{bmatrix} 1 & \epsilon^{21} & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{241274} = \begin{bmatrix} 1 & 57 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{241274} = \mathbf{Pl}(0, 0, 1, 1, 56, 1)_{14958978} \\
\ell_2 &= \begin{bmatrix} 1 & \epsilon^{21} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{21} \end{bmatrix}_{241330} = \begin{bmatrix} 1 & 57 & 0 & 0 \\ 0 & 0 & 1 & 57 \end{bmatrix}_{241330} = \mathbf{Pl}(0, 0, 56, 57, 1, 1)_{551563} \\
\ell_3 &= \begin{bmatrix} 1 & \epsilon^{21} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{42} \end{bmatrix}_{241329} = \begin{bmatrix} 1 & 57 & 0 & 0 \\ 0 & 0 & 1 & 56 \end{bmatrix}_{241329} = \mathbf{Pl}(0, 0, 57, 56, 57, 1)_{15228170} \\
\ell_4 &= \begin{bmatrix} 1 & \epsilon^{42} & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{237113} = \begin{bmatrix} 1 & 56 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{237113} = \mathbf{Pl}(0, 0, 1, 1, 57, 1)_{15221058} \\
\ell_5 &= \begin{bmatrix} 1 & \epsilon^{42} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{21} \end{bmatrix}_{237169} = \begin{bmatrix} 1 & 56 & 0 & 0 \\ 0 & 0 & 1 & 57 \end{bmatrix}_{237169} = \mathbf{Pl}(0, 0, 56, 57, 56, 1)_{14965963} \\
\ell_6 &= \begin{bmatrix} 1 & \epsilon^{42} & 0 & 0 \\ 0 & 0 & 1 & \epsilon^{42} \end{bmatrix}_{237168} = \begin{bmatrix} 1 & 56 & 0 & 0 \\ 0 & 0 & 1 & 56 \end{bmatrix}_{237168} = \mathbf{Pl}(0, 0, 57, 56, 1, 1)_{551690}
\end{aligned}$$

Rank of lines: (0, 241274, 241330, 241329, 237113, 237169, 237168)

Rank of points on Klein quadric: (0, 14958978, 551563, 15228170, 15221058, 14965963, 551690)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 3 Double points:

The double points on the surface are:

$$P_{8258} = (0, 0, 1, 1) = \ell_1 \cap \ell_4$$

$$P_{233537} = (0, 0, 56, 1) = \ell_2 \cap \ell_5$$

$$P_{237633} = (0, 0, 57, 1) = \ell_3 \cap \ell_6$$

Single Points

The surface has 441 single points:

The single points on the surface are:

0 : $P_0 = (1, 0, 0, 0)$ lies on line ℓ_0

1 : $P_1 = (0, 1, 0, 0)$ lies on line ℓ_0

2 : $P_5 = (1, 1, 0, 0)$ lies on line ℓ_0

3 : $P_6 = (2, 1, 0, 0)$ lies on line ℓ_0

4 : $P_7 = (3, 1, 0, 0)$ lies on line ℓ_0

5 : $P_8 = (4, 1, 0, 0)$ lies on line ℓ_0

6 : $P_9 = (5, 1, 0, 0)$ lies on line ℓ_0

7 : $P_{10} = (6, 1, 0, 0)$ lies on line ℓ_0

8 : $P_{11} = (7, 1, 0, 0)$ lies on line ℓ_0

9 : $P_{12} = (8, 1, 0, 0)$ lies on line ℓ_0

10 : $P_{13} = (9, 1, 0, 0)$ lies on line ℓ_0

11 : $P_{14} = (10, 1, 0, 0)$ lies on line ℓ_0

12 : $P_{15} = (11, 1, 0, 0)$ lies on line ℓ_0

13 : $P_{16} = (12, 1, 0, 0)$ lies on line ℓ_0

14 : $P_{17} = (13, 1, 0, 0)$ lies on line ℓ_0

15 : $P_{18} = (14, 1, 0, 0)$ lies on line ℓ_0

16 : $P_{19} = (15, 1, 0, 0)$ lies on line ℓ_0

17 : $P_{20} = (16, 1, 0, 0)$ lies on line ℓ_0

18 : $P_{21} = (17, 1, 0, 0)$ lies on line ℓ_0

19 : $P_{22} = (18, 1, 0, 0)$ lies on line ℓ_0

20 : $P_{23} = (19, 1, 0, 0)$ lies on line ℓ_0

21 : $P_{24} = (20, 1, 0, 0)$ lies on line ℓ_0

22 : $P_{25} = (21, 1, 0, 0)$ lies on line ℓ_0

23 : $P_{26} = (22, 1, 0, 0)$ lies on line ℓ_0

24 : $P_{27} = (23, 1, 0, 0)$ lies on line ℓ_0

25 : $P_{28} = (24, 1, 0, 0)$ lies on line ℓ_0

26 : $P_{29} = (25, 1, 0, 0)$ lies on line ℓ_0

27 : $P_{30} = (26, 1, 0, 0)$ lies on line ℓ_0

28 : $P_{31} = (27, 1, 0, 0)$ lies on line ℓ_0

29 : $P_{32} = (28, 1, 0, 0)$ lies on line ℓ_0

30 : $P_{33} = (29, 1, 0, 0)$ lies on line ℓ_0
 31 : $P_{34} = (30, 1, 0, 0)$ lies on line ℓ_0
 32 : $P_{35} = (31, 1, 0, 0)$ lies on line ℓ_0
 33 : $P_{36} = (32, 1, 0, 0)$ lies on line ℓ_0
 34 : $P_{37} = (33, 1, 0, 0)$ lies on line ℓ_0
 35 : $P_{38} = (34, 1, 0, 0)$ lies on line ℓ_0
 36 : $P_{39} = (35, 1, 0, 0)$ lies on line ℓ_0
 37 : $P_{40} = (36, 1, 0, 0)$ lies on line ℓ_0
 38 : $P_{41} = (37, 1, 0, 0)$ lies on line ℓ_0
 39 : $P_{42} = (38, 1, 0, 0)$ lies on line ℓ_0
 40 : $P_{43} = (39, 1, 0, 0)$ lies on line ℓ_0
 41 : $P_{44} = (40, 1, 0, 0)$ lies on line ℓ_0
 42 : $P_{45} = (41, 1, 0, 0)$ lies on line ℓ_0
 43 : $P_{46} = (42, 1, 0, 0)$ lies on line ℓ_0
 44 : $P_{47} = (43, 1, 0, 0)$ lies on line ℓ_0
 45 : $P_{48} = (44, 1, 0, 0)$ lies on line ℓ_0
 46 : $P_{49} = (45, 1, 0, 0)$ lies on line ℓ_0
 47 : $P_{50} = (46, 1, 0, 0)$ lies on line ℓ_0
 48 : $P_{51} = (47, 1, 0, 0)$ lies on line ℓ_0
 49 : $P_{52} = (48, 1, 0, 0)$ lies on line ℓ_0
 50 : $P_{53} = (49, 1, 0, 0)$ lies on line ℓ_0
 51 : $P_{54} = (50, 1, 0, 0)$ lies on line ℓ_0
 52 : $P_{55} = (51, 1, 0, 0)$ lies on line ℓ_0
 53 : $P_{56} = (52, 1, 0, 0)$ lies on line ℓ_0
 54 : $P_{57} = (53, 1, 0, 0)$ lies on line ℓ_0
 55 : $P_{58} = (54, 1, 0, 0)$ lies on line ℓ_0
 56 : $P_{59} = (55, 1, 0, 0)$ lies on line ℓ_0
 57 : $P_{62} = (58, 1, 0, 0)$ lies on line ℓ_0
 58 : $P_{63} = (59, 1, 0, 0)$ lies on line ℓ_0
 59 : $P_{64} = (60, 1, 0, 0)$ lies on line ℓ_0
 60 : $P_{65} = (61, 1, 0, 0)$ lies on line ℓ_0
 61 : $P_{66} = (62, 1, 0, 0)$ lies on line ℓ_0
 62 : $P_{67} = (63, 1, 0, 0)$ lies on line ℓ_0
 63 : $P_{8377} = (56, 1, 1, 1)$ lies on line ℓ_1
 64 : $P_{8378} = (57, 1, 1, 1)$ lies on line ℓ_4
 65 : $P_{8402} = (17, 2, 1, 1)$ lies on line ℓ_1
 66 : $P_{8404} = (19, 2, 1, 1)$ lies on line ℓ_4
 67 : $P_{8490} = (41, 3, 1, 1)$ lies on line ℓ_1
 68 : $P_{8491} = (42, 3, 1, 1)$ lies on line ℓ_4
 69 : $P_{8547} = (34, 4, 1, 1)$ lies on line ℓ_1
 70 : $P_{8551} = (38, 4, 1, 1)$ lies on line ℓ_4
 71 : $P_{8603} = (26, 5, 1, 1)$ lies on line ℓ_1
 72 : $P_{8608} = (31, 5, 1, 1)$ lies on line ℓ_4
 73 : $P_{8692} = (51, 6, 1, 1)$ lies on line ℓ_1
 74 : $P_{8694} = (53, 6, 1, 1)$ lies on line ℓ_4
 75 : $P_{8716} = (11, 7, 1, 1)$ lies on line ℓ_1
 76 : $P_{8717} = (12, 7, 1, 1)$ lies on line ℓ_4
 77 : $P_{8806} = (37, 8, 1, 1)$ lies on line ℓ_1
 78 : $P_{8814} = (45, 8, 1, 1)$ lies on line ℓ_4
 79 : $P_{8853} = (20, 9, 1, 1)$ lies on line ℓ_4
 80 : $P_{8862} = (29, 9, 1, 1)$ lies on line ℓ_1
 81 : $P_{8949} = (52, 10, 1, 1)$ lies on line ℓ_1
 82 : $P_{8959} = (62, 10, 1, 1)$ lies on line ℓ_4
 83 : $P_{8968} = (7, 11, 1, 1)$ lies on line ℓ_4

84 : $P_{8973} = (12, 11, 1, 1)$ lies on line ℓ_1
 85 : $P_{9032} = (7, 12, 1, 1)$ lies on line ℓ_1
 86 : $P_{9036} = (11, 12, 1, 1)$ lies on line ℓ_4
 87 : $P_{9139} = (50, 13, 1, 1)$ lies on line ℓ_4
 88 : $P_{9152} = (63, 13, 1, 1)$ lies on line ℓ_1
 89 : $P_{9175} = (22, 14, 1, 1)$ lies on line ℓ_1
 90 : $P_{9177} = (24, 14, 1, 1)$ lies on line ℓ_4
 91 : $P_{9250} = (33, 15, 1, 1)$ lies on line ℓ_4
 92 : $P_{9263} = (46, 15, 1, 1)$ lies on line ℓ_1
 93 : $P_{9324} = (43, 16, 1, 1)$ lies on line ℓ_1
 94 : $P_{9340} = (59, 16, 1, 1)$ lies on line ℓ_4
 95 : $P_{9347} = (2, 17, 1, 1)$ lies on line ℓ_4
 96 : $P_{9364} = (19, 17, 1, 1)$ lies on line ℓ_1
 97 : $P_{9449} = (40, 18, 1, 1)$ lies on line ℓ_4
 98 : $P_{9467} = (58, 18, 1, 1)$ lies on line ℓ_1
 99 : $P_{9475} = (2, 19, 1, 1)$ lies on line ℓ_1
 100 : $P_{9490} = (17, 19, 1, 1)$ lies on line ℓ_4
 101 : $P_{9546} = (9, 20, 1, 1)$ lies on line ℓ_1
 102 : $P_{9566} = (29, 20, 1, 1)$ lies on line ℓ_4
 103 : $P_{9637} = (36, 21, 1, 1)$ lies on line ℓ_4
 104 : $P_{9650} = (49, 21, 1, 1)$ lies on line ℓ_1
 105 : $P_{9679} = (14, 22, 1, 1)$ lies on line ℓ_4
 106 : $P_{9689} = (24, 22, 1, 1)$ lies on line ℓ_1
 107 : $P_{9761} = (32, 23, 1, 1)$ lies on line ℓ_1
 108 : $P_{9784} = (55, 23, 1, 1)$ lies on line ℓ_4
 109 : $P_{9807} = (14, 24, 1, 1)$ lies on line ℓ_1
 110 : $P_{9815} = (22, 24, 1, 1)$ lies on line ℓ_4
 111 : $P_{9904} = (47, 25, 1, 1)$ lies on line ℓ_4
 112 : $P_{9911} = (54, 25, 1, 1)$ lies on line ℓ_1
 113 : $P_{9926} = (5, 26, 1, 1)$ lies on line ℓ_4
 114 : $P_{9952} = (31, 26, 1, 1)$ lies on line ℓ_1
 115 : $P_{10024} = (39, 27, 1, 1)$ lies on line ℓ_1
 116 : $P_{10045} = (60, 27, 1, 1)$ lies on line ℓ_4
 117 : $P_{10093} = (44, 28, 1, 1)$ lies on line ℓ_1
 118 : $P_{10097} = (48, 28, 1, 1)$ lies on line ℓ_4
 119 : $P_{10122} = (9, 29, 1, 1)$ lies on line ℓ_4
 120 : $P_{10133} = (20, 29, 1, 1)$ lies on line ℓ_1
 121 : $P_{10212} = (35, 30, 1, 1)$ lies on line ℓ_4
 122 : $P_{10238} = (61, 30, 1, 1)$ lies on line ℓ_1
 123 : $P_{10246} = (5, 31, 1, 1)$ lies on line ℓ_1
 124 : $P_{10267} = (26, 31, 1, 1)$ lies on line ℓ_4
 125 : $P_{10328} = (23, 32, 1, 1)$ lies on line ℓ_4
 126 : $P_{10360} = (55, 32, 1, 1)$ lies on line ℓ_1
 127 : $P_{10384} = (15, 33, 1, 1)$ lies on line ℓ_1
 128 : $P_{10415} = (46, 33, 1, 1)$ lies on line ℓ_4
 129 : $P_{10437} = (4, 34, 1, 1)$ lies on line ℓ_4
 130 : $P_{10471} = (38, 34, 1, 1)$ lies on line ℓ_1
 131 : $P_{10527} = (30, 35, 1, 1)$ lies on line ℓ_1
 132 : $P_{10558} = (61, 35, 1, 1)$ lies on line ℓ_4
 133 : $P_{10582} = (21, 36, 1, 1)$ lies on line ℓ_1
 134 : $P_{10610} = (49, 36, 1, 1)$ lies on line ℓ_4
 135 : $P_{10633} = (8, 37, 1, 1)$ lies on line ℓ_4
 136 : $P_{10670} = (45, 37, 1, 1)$ lies on line ℓ_1
 137 : $P_{10693} = (4, 38, 1, 1)$ lies on line ℓ_1

138 : $P_{10723} = (34, 38, 1, 1)$ lies on line ℓ_4
 139 : $P_{10780} = (27, 39, 1, 1)$ lies on line ℓ_4
 140 : $P_{10813} = (60, 39, 1, 1)$ lies on line ℓ_1
 141 : $P_{10835} = (18, 40, 1, 1)$ lies on line ℓ_1
 142 : $P_{10875} = (58, 40, 1, 1)$ lies on line ℓ_4
 143 : $P_{10884} = (3, 41, 1, 1)$ lies on line ℓ_4
 144 : $P_{10923} = (42, 41, 1, 1)$ lies on line ℓ_1
 145 : $P_{10948} = (3, 42, 1, 1)$ lies on line ℓ_1
 146 : $P_{10986} = (41, 42, 1, 1)$ lies on line ℓ_4
 147 : $P_{11025} = (16, 43, 1, 1)$ lies on line ℓ_4
 148 : $P_{11068} = (59, 43, 1, 1)$ lies on line ℓ_1
 149 : $P_{11101} = (28, 44, 1, 1)$ lies on line ℓ_4
 150 : $P_{11121} = (48, 44, 1, 1)$ lies on line ℓ_1
 151 : $P_{11145} = (8, 45, 1, 1)$ lies on line ℓ_1
 152 : $P_{11174} = (37, 45, 1, 1)$ lies on line ℓ_4
 153 : $P_{11216} = (15, 46, 1, 1)$ lies on line ℓ_4
 154 : $P_{11234} = (33, 46, 1, 1)$ lies on line ℓ_1
 155 : $P_{11290} = (25, 47, 1, 1)$ lies on line ℓ_1
 156 : $P_{11319} = (54, 47, 1, 1)$ lies on line ℓ_4
 157 : $P_{11357} = (28, 48, 1, 1)$ lies on line ℓ_1
 158 : $P_{11373} = (44, 48, 1, 1)$ lies on line ℓ_4
 159 : $P_{11414} = (21, 49, 1, 1)$ lies on line ℓ_4
 160 : $P_{11429} = (36, 49, 1, 1)$ lies on line ℓ_1
 161 : $P_{11470} = (13, 50, 1, 1)$ lies on line ℓ_1
 162 : $P_{11520} = (63, 50, 1, 1)$ lies on line ℓ_4
 163 : $P_{11527} = (6, 51, 1, 1)$ lies on line ℓ_4
 164 : $P_{11574} = (53, 51, 1, 1)$ lies on line ℓ_1
 165 : $P_{11595} = (10, 52, 1, 1)$ lies on line ℓ_4
 166 : $P_{11647} = (62, 52, 1, 1)$ lies on line ℓ_1
 167 : $P_{11655} = (6, 53, 1, 1)$ lies on line ℓ_1
 168 : $P_{11700} = (51, 53, 1, 1)$ lies on line ℓ_4
 169 : $P_{11738} = (25, 54, 1, 1)$ lies on line ℓ_4
 170 : $P_{11760} = (47, 54, 1, 1)$ lies on line ℓ_1
 171 : $P_{11800} = (23, 55, 1, 1)$ lies on line ℓ_1
 172 : $P_{11809} = (32, 55, 1, 1)$ lies on line ℓ_4
 173 : $P_{11842} = (1, 56, 1, 1)$ lies on line ℓ_4
 174 : $P_{11898} = (57, 56, 1, 1)$ lies on line ℓ_1
 175 : $P_{11906} = (1, 57, 1, 1)$ lies on line ℓ_1
 176 : $P_{11961} = (56, 57, 1, 1)$ lies on line ℓ_4
 177 : $P_{11987} = (18, 58, 1, 1)$ lies on line ℓ_4
 178 : $P_{12009} = (40, 58, 1, 1)$ lies on line ℓ_1
 179 : $P_{12049} = (16, 59, 1, 1)$ lies on line ℓ_1
 180 : $P_{12076} = (43, 59, 1, 1)$ lies on line ℓ_4
 181 : $P_{12124} = (27, 60, 1, 1)$ lies on line ℓ_1
 182 : $P_{12136} = (39, 60, 1, 1)$ lies on line ℓ_4
 183 : $P_{12191} = (30, 61, 1, 1)$ lies on line ℓ_4
 184 : $P_{12196} = (35, 61, 1, 1)$ lies on line ℓ_1
 185 : $P_{12235} = (10, 62, 1, 1)$ lies on line ℓ_1
 186 : $P_{12277} = (52, 62, 1, 1)$ lies on line ℓ_4
 187 : $P_{12302} = (13, 63, 1, 1)$ lies on line ℓ_4
 188 : $P_{12339} = (50, 63, 1, 1)$ lies on line ℓ_1
 189 : $P_{233657} = (56, 1, 56, 1)$ lies on line ℓ_2
 190 : $P_{233658} = (57, 1, 56, 1)$ lies on line ℓ_5
 191 : $P_{233682} = (17, 2, 56, 1)$ lies on line ℓ_2

192 : $P_{233684} = (19, 2, 56, 1)$ lies on line ℓ_5
 193 : $P_{233770} = (41, 3, 56, 1)$ lies on line ℓ_2
 194 : $P_{233771} = (42, 3, 56, 1)$ lies on line ℓ_5
 195 : $P_{233827} = (34, 4, 56, 1)$ lies on line ℓ_2
 196 : $P_{233831} = (38, 4, 56, 1)$ lies on line ℓ_5
 197 : $P_{233883} = (26, 5, 56, 1)$ lies on line ℓ_2
 198 : $P_{233888} = (31, 5, 56, 1)$ lies on line ℓ_5
 199 : $P_{233972} = (51, 6, 56, 1)$ lies on line ℓ_2
 200 : $P_{233974} = (53, 6, 56, 1)$ lies on line ℓ_5
 201 : $P_{233996} = (11, 7, 56, 1)$ lies on line ℓ_2
 202 : $P_{233997} = (12, 7, 56, 1)$ lies on line ℓ_5
 203 : $P_{234086} = (37, 8, 56, 1)$ lies on line ℓ_2
 204 : $P_{234094} = (45, 8, 56, 1)$ lies on line ℓ_5
 205 : $P_{234133} = (20, 9, 56, 1)$ lies on line ℓ_5
 206 : $P_{234142} = (29, 9, 56, 1)$ lies on line ℓ_2
 207 : $P_{234229} = (52, 10, 56, 1)$ lies on line ℓ_2
 208 : $P_{234239} = (62, 10, 56, 1)$ lies on line ℓ_5
 209 : $P_{234248} = (7, 11, 56, 1)$ lies on line ℓ_5
 210 : $P_{234253} = (12, 11, 56, 1)$ lies on line ℓ_2
 211 : $P_{234312} = (7, 12, 56, 1)$ lies on line ℓ_2
 212 : $P_{234316} = (11, 12, 56, 1)$ lies on line ℓ_5
 213 : $P_{234419} = (50, 13, 56, 1)$ lies on line ℓ_5
 214 : $P_{234432} = (63, 13, 56, 1)$ lies on line ℓ_2
 215 : $P_{234455} = (22, 14, 56, 1)$ lies on line ℓ_2
 216 : $P_{234457} = (24, 14, 56, 1)$ lies on line ℓ_5
 217 : $P_{234530} = (33, 15, 56, 1)$ lies on line ℓ_5
 218 : $P_{234543} = (46, 15, 56, 1)$ lies on line ℓ_2
 219 : $P_{234604} = (43, 16, 56, 1)$ lies on line ℓ_2
 220 : $P_{234620} = (59, 16, 56, 1)$ lies on line ℓ_5
 221 : $P_{234627} = (2, 17, 56, 1)$ lies on line ℓ_5
 222 : $P_{234644} = (19, 17, 56, 1)$ lies on line ℓ_2
 223 : $P_{234729} = (40, 18, 56, 1)$ lies on line ℓ_5
 224 : $P_{234747} = (58, 18, 56, 1)$ lies on line ℓ_2
 225 : $P_{234755} = (2, 19, 56, 1)$ lies on line ℓ_2
 226 : $P_{234770} = (17, 19, 56, 1)$ lies on line ℓ_5
 227 : $P_{234826} = (9, 20, 56, 1)$ lies on line ℓ_2
 228 : $P_{234846} = (29, 20, 56, 1)$ lies on line ℓ_5
 229 : $P_{234917} = (36, 21, 56, 1)$ lies on line ℓ_5
 230 : $P_{234930} = (49, 21, 56, 1)$ lies on line ℓ_2
 231 : $P_{234959} = (14, 22, 56, 1)$ lies on line ℓ_5
 232 : $P_{234969} = (24, 22, 56, 1)$ lies on line ℓ_2
 233 : $P_{235041} = (32, 23, 56, 1)$ lies on line ℓ_2
 234 : $P_{235064} = (55, 23, 56, 1)$ lies on line ℓ_5
 235 : $P_{235087} = (14, 24, 56, 1)$ lies on line ℓ_2
 236 : $P_{235095} = (22, 24, 56, 1)$ lies on line ℓ_5
 237 : $P_{235184} = (47, 25, 56, 1)$ lies on line ℓ_5
 238 : $P_{235191} = (54, 25, 56, 1)$ lies on line ℓ_2
 239 : $P_{235206} = (5, 26, 56, 1)$ lies on line ℓ_5
 240 : $P_{235232} = (31, 26, 56, 1)$ lies on line ℓ_2
 241 : $P_{235304} = (39, 27, 56, 1)$ lies on line ℓ_2
 242 : $P_{235325} = (60, 27, 56, 1)$ lies on line ℓ_5
 243 : $P_{235373} = (44, 28, 56, 1)$ lies on line ℓ_2
 244 : $P_{235377} = (48, 28, 56, 1)$ lies on line ℓ_5
 245 : $P_{235402} = (9, 29, 56, 1)$ lies on line ℓ_5

246 : $P_{235413} = (20, 29, 56, 1)$ lies on line ℓ_2
 247 : $P_{235492} = (35, 30, 56, 1)$ lies on line ℓ_5
 248 : $P_{235518} = (61, 30, 56, 1)$ lies on line ℓ_2
 249 : $P_{235526} = (5, 31, 56, 1)$ lies on line ℓ_2
 250 : $P_{235547} = (26, 31, 56, 1)$ lies on line ℓ_5
 251 : $P_{235608} = (23, 32, 56, 1)$ lies on line ℓ_5
 252 : $P_{235640} = (55, 32, 56, 1)$ lies on line ℓ_2
 253 : $P_{235664} = (15, 33, 56, 1)$ lies on line ℓ_2
 254 : $P_{235695} = (46, 33, 56, 1)$ lies on line ℓ_5
 255 : $P_{235717} = (4, 34, 56, 1)$ lies on line ℓ_5
 256 : $P_{235751} = (38, 34, 56, 1)$ lies on line ℓ_2
 257 : $P_{235807} = (30, 35, 56, 1)$ lies on line ℓ_2
 258 : $P_{235838} = (61, 35, 56, 1)$ lies on line ℓ_5
 259 : $P_{235862} = (21, 36, 56, 1)$ lies on line ℓ_2
 260 : $P_{235890} = (49, 36, 56, 1)$ lies on line ℓ_5
 261 : $P_{235913} = (8, 37, 56, 1)$ lies on line ℓ_5
 262 : $P_{235950} = (45, 37, 56, 1)$ lies on line ℓ_2
 263 : $P_{235973} = (4, 38, 56, 1)$ lies on line ℓ_2
 264 : $P_{236003} = (34, 38, 56, 1)$ lies on line ℓ_5
 265 : $P_{236060} = (27, 39, 56, 1)$ lies on line ℓ_5
 266 : $P_{236093} = (60, 39, 56, 1)$ lies on line ℓ_2
 267 : $P_{236115} = (18, 40, 56, 1)$ lies on line ℓ_2
 268 : $P_{236155} = (58, 40, 56, 1)$ lies on line ℓ_5
 269 : $P_{236164} = (3, 41, 56, 1)$ lies on line ℓ_5
 270 : $P_{236203} = (42, 41, 56, 1)$ lies on line ℓ_2
 271 : $P_{236228} = (3, 42, 56, 1)$ lies on line ℓ_2
 272 : $P_{236266} = (41, 42, 56, 1)$ lies on line ℓ_5
 273 : $P_{236305} = (16, 43, 56, 1)$ lies on line ℓ_5
 274 : $P_{236348} = (59, 43, 56, 1)$ lies on line ℓ_2
 275 : $P_{236381} = (28, 44, 56, 1)$ lies on line ℓ_5
 276 : $P_{236401} = (48, 44, 56, 1)$ lies on line ℓ_2
 277 : $P_{236425} = (8, 45, 56, 1)$ lies on line ℓ_2
 278 : $P_{236454} = (37, 45, 56, 1)$ lies on line ℓ_5
 279 : $P_{236496} = (15, 46, 56, 1)$ lies on line ℓ_5
 280 : $P_{236514} = (33, 46, 56, 1)$ lies on line ℓ_2
 281 : $P_{236570} = (25, 47, 56, 1)$ lies on line ℓ_2
 282 : $P_{236599} = (54, 47, 56, 1)$ lies on line ℓ_5
 283 : $P_{236637} = (28, 48, 56, 1)$ lies on line ℓ_2
 284 : $P_{236653} = (44, 48, 56, 1)$ lies on line ℓ_5
 285 : $P_{236694} = (21, 49, 56, 1)$ lies on line ℓ_5
 286 : $P_{236709} = (36, 49, 56, 1)$ lies on line ℓ_2
 287 : $P_{236750} = (13, 50, 56, 1)$ lies on line ℓ_2
 288 : $P_{236800} = (63, 50, 56, 1)$ lies on line ℓ_5
 289 : $P_{236807} = (6, 51, 56, 1)$ lies on line ℓ_5
 290 : $P_{236854} = (53, 51, 56, 1)$ lies on line ℓ_2
 291 : $P_{236875} = (10, 52, 56, 1)$ lies on line ℓ_5
 292 : $P_{236927} = (62, 52, 56, 1)$ lies on line ℓ_2
 293 : $P_{236935} = (6, 53, 56, 1)$ lies on line ℓ_2
 294 : $P_{236980} = (51, 53, 56, 1)$ lies on line ℓ_5
 295 : $P_{237018} = (25, 54, 56, 1)$ lies on line ℓ_5
 296 : $P_{237040} = (47, 54, 56, 1)$ lies on line ℓ_2
 297 : $P_{237080} = (23, 55, 56, 1)$ lies on line ℓ_2
 298 : $P_{237089} = (32, 55, 56, 1)$ lies on line ℓ_5
 299 : $P_{237122} = (1, 56, 56, 1)$ lies on line ℓ_5
 300 : $P_{237178} = (57, 56, 56, 1)$ lies on line ℓ_2
 301 : $P_{237186} = (1, 57, 56, 1)$ lies on line ℓ_2
 302 : $P_{237241} = (56, 57, 56, 1)$ lies on line ℓ_5
 303 : $P_{237267} = (18, 58, 56, 1)$ lies on line ℓ_5
 304 : $P_{237289} = (40, 58, 56, 1)$ lies on line ℓ_2
 305 : $P_{237329} = (16, 59, 56, 1)$ lies on line ℓ_2
 306 : $P_{237356} = (43, 59, 56, 1)$ lies on line ℓ_5
 307 : $P_{237404} = (27, 60, 56, 1)$ lies on line ℓ_2
 308 : $P_{237416} = (39, 60, 56, 1)$ lies on line ℓ_5
 309 : $P_{237471} = (30, 61, 56, 1)$ lies on line ℓ_5
 310 : $P_{237476} = (35, 61, 56, 1)$ lies on line ℓ_2
 311 : $P_{237515} = (10, 62, 56, 1)$ lies on line ℓ_2
 312 : $P_{237557} = (52, 62, 56, 1)$ lies on line ℓ_5
 313 : $P_{237582} = (13, 63, 56, 1)$ lies on line ℓ_5
 314 : $P_{237619} = (50, 63, 56, 1)$ lies on line ℓ_2
 315 : $P_{237753} = (56, 1, 57, 1)$ lies on line ℓ_3
 316 : $P_{237754} = (57, 1, 57, 1)$ lies on line ℓ_6
 317 : $P_{237778} = (17, 2, 57, 1)$ lies on line ℓ_3
 318 : $P_{237780} = (19, 2, 57, 1)$ lies on line ℓ_6
 319 : $P_{237866} = (41, 3, 57, 1)$ lies on line ℓ_3
 320 : $P_{237867} = (42, 3, 57, 1)$ lies on line ℓ_6
 321 : $P_{237923} = (34, 4, 57, 1)$ lies on line ℓ_3
 322 : $P_{237927} = (38, 4, 57, 1)$ lies on line ℓ_6
 323 : $P_{237979} = (26, 5, 57, 1)$ lies on line ℓ_3
 324 : $P_{237984} = (31, 5, 57, 1)$ lies on line ℓ_6
 325 : $P_{238068} = (51, 6, 57, 1)$ lies on line ℓ_3
 326 : $P_{238070} = (53, 6, 57, 1)$ lies on line ℓ_6
 327 : $P_{238092} = (11, 7, 57, 1)$ lies on line ℓ_3
 328 : $P_{238093} = (12, 7, 57, 1)$ lies on line ℓ_6
 329 : $P_{238182} = (37, 8, 57, 1)$ lies on line ℓ_3
 330 : $P_{238190} = (45, 8, 57, 1)$ lies on line ℓ_6
 331 : $P_{238229} = (20, 9, 57, 1)$ lies on line ℓ_6
 332 : $P_{238238} = (29, 9, 57, 1)$ lies on line ℓ_3
 333 : $P_{238325} = (52, 10, 57, 1)$ lies on line ℓ_3
 334 : $P_{238335} = (62, 10, 57, 1)$ lies on line ℓ_6
 335 : $P_{238344} = (7, 11, 57, 1)$ lies on line ℓ_6
 336 : $P_{238349} = (12, 11, 57, 1)$ lies on line ℓ_3
 337 : $P_{238408} = (7, 12, 57, 1)$ lies on line ℓ_3
 338 : $P_{238412} = (11, 12, 57, 1)$ lies on line ℓ_6
 339 : $P_{238515} = (50, 13, 57, 1)$ lies on line ℓ_6
 340 : $P_{238528} = (63, 13, 57, 1)$ lies on line ℓ_3
 341 : $P_{238551} = (22, 14, 57, 1)$ lies on line ℓ_3
 342 : $P_{238553} = (24, 14, 57, 1)$ lies on line ℓ_6
 343 : $P_{238626} = (33, 15, 57, 1)$ lies on line ℓ_6
 344 : $P_{238639} = (46, 15, 57, 1)$ lies on line ℓ_3
 345 : $P_{238700} = (43, 16, 57, 1)$ lies on line ℓ_3
 346 : $P_{238716} = (59, 16, 57, 1)$ lies on line ℓ_6
 347 : $P_{238723} = (2, 17, 57, 1)$ lies on line ℓ_6
 348 : $P_{238740} = (19, 17, 57, 1)$ lies on line ℓ_3
 349 : $P_{238825} = (40, 18, 57, 1)$ lies on line ℓ_6
 350 : $P_{238843} = (58, 18, 57, 1)$ lies on line ℓ_3
 351 : $P_{238851} = (2, 19, 57, 1)$ lies on line ℓ_3
 352 : $P_{238866} = (17, 19, 57, 1)$ lies on line ℓ_6
 353 : $P_{238922} = (9, 20, 57, 1)$ lies on line ℓ_3

354 : $P_{238942} = (29, 20, 57, 1)$ lies on line ℓ_6
 355 : $P_{239013} = (36, 21, 57, 1)$ lies on line ℓ_6
 356 : $P_{239026} = (49, 21, 57, 1)$ lies on line ℓ_3
 357 : $P_{239055} = (14, 22, 57, 1)$ lies on line ℓ_6
 358 : $P_{239065} = (24, 22, 57, 1)$ lies on line ℓ_3
 359 : $P_{239137} = (32, 23, 57, 1)$ lies on line ℓ_3
 360 : $P_{239160} = (55, 23, 57, 1)$ lies on line ℓ_6
 361 : $P_{239183} = (14, 24, 57, 1)$ lies on line ℓ_3
 362 : $P_{239191} = (22, 24, 57, 1)$ lies on line ℓ_6
 363 : $P_{239280} = (47, 25, 57, 1)$ lies on line ℓ_6
 364 : $P_{239287} = (54, 25, 57, 1)$ lies on line ℓ_3
 365 : $P_{239302} = (5, 26, 57, 1)$ lies on line ℓ_6
 366 : $P_{239328} = (31, 26, 57, 1)$ lies on line ℓ_3
 367 : $P_{239400} = (39, 27, 57, 1)$ lies on line ℓ_3
 368 : $P_{239421} = (60, 27, 57, 1)$ lies on line ℓ_6
 369 : $P_{239469} = (44, 28, 57, 1)$ lies on line ℓ_3
 370 : $P_{239473} = (48, 28, 57, 1)$ lies on line ℓ_6
 371 : $P_{239498} = (9, 29, 57, 1)$ lies on line ℓ_6
 372 : $P_{239509} = (20, 29, 57, 1)$ lies on line ℓ_3
 373 : $P_{239588} = (35, 30, 57, 1)$ lies on line ℓ_6
 374 : $P_{239614} = (61, 30, 57, 1)$ lies on line ℓ_3
 375 : $P_{239622} = (5, 31, 57, 1)$ lies on line ℓ_3
 376 : $P_{239643} = (26, 31, 57, 1)$ lies on line ℓ_6
 377 : $P_{239704} = (23, 32, 57, 1)$ lies on line ℓ_6
 378 : $P_{239736} = (55, 32, 57, 1)$ lies on line ℓ_3
 379 : $P_{239760} = (15, 33, 57, 1)$ lies on line ℓ_3
 380 : $P_{239791} = (46, 33, 57, 1)$ lies on line ℓ_6
 381 : $P_{239813} = (4, 34, 57, 1)$ lies on line ℓ_6
 382 : $P_{239847} = (38, 34, 57, 1)$ lies on line ℓ_3
 383 : $P_{239903} = (30, 35, 57, 1)$ lies on line ℓ_3
 384 : $P_{239934} = (61, 35, 57, 1)$ lies on line ℓ_6
 385 : $P_{239958} = (21, 36, 57, 1)$ lies on line ℓ_3
 386 : $P_{239986} = (49, 36, 57, 1)$ lies on line ℓ_6
 387 : $P_{240009} = (8, 37, 57, 1)$ lies on line ℓ_6
 388 : $P_{240046} = (45, 37, 57, 1)$ lies on line ℓ_3
 389 : $P_{240069} = (4, 38, 57, 1)$ lies on line ℓ_3
 390 : $P_{240099} = (34, 38, 57, 1)$ lies on line ℓ_6
 391 : $P_{240156} = (27, 39, 57, 1)$ lies on line ℓ_6
 392 : $P_{240189} = (60, 39, 57, 1)$ lies on line ℓ_3
 393 : $P_{240211} = (18, 40, 57, 1)$ lies on line ℓ_3
 394 : $P_{240251} = (58, 40, 57, 1)$ lies on line ℓ_6
 395 : $P_{240260} = (3, 41, 57, 1)$ lies on line ℓ_6
 396 : $P_{240299} = (42, 41, 57, 1)$ lies on line ℓ_3
 397 : $P_{240324} = (3, 42, 57, 1)$ lies on line ℓ_3
 398 : $P_{240362} = (41, 42, 57, 1)$ lies on line ℓ_6
 399 : $P_{240401} = (16, 43, 57, 1)$ lies on line ℓ_6
 400 : $P_{240444} = (59, 43, 57, 1)$ lies on line ℓ_3
 401 : $P_{240477} = (28, 44, 57, 1)$ lies on line ℓ_6
 402 : $P_{240497} = (48, 44, 57, 1)$ lies on line ℓ_3
 403 : $P_{240521} = (8, 45, 57, 1)$ lies on line ℓ_3
 404 : $P_{240550} = (37, 45, 57, 1)$ lies on line ℓ_6
 405 : $P_{240592} = (15, 46, 57, 1)$ lies on line ℓ_6
 406 : $P_{240610} = (33, 46, 57, 1)$ lies on line ℓ_3
 407 : $P_{240666} = (25, 47, 57, 1)$ lies on line ℓ_3
 408 : $P_{240695} = (54, 47, 57, 1)$ lies on line ℓ_6
 409 : $P_{240733} = (28, 48, 57, 1)$ lies on line ℓ_3
 410 : $P_{240749} = (44, 48, 57, 1)$ lies on line ℓ_6
 411 : $P_{240790} = (21, 49, 57, 1)$ lies on line ℓ_6
 412 : $P_{240805} = (36, 49, 57, 1)$ lies on line ℓ_3
 413 : $P_{240846} = (13, 50, 57, 1)$ lies on line ℓ_3
 414 : $P_{240896} = (63, 50, 57, 1)$ lies on line ℓ_6
 415 : $P_{240903} = (6, 51, 57, 1)$ lies on line ℓ_6
 416 : $P_{240950} = (53, 51, 57, 1)$ lies on line ℓ_3
 417 : $P_{240971} = (10, 52, 57, 1)$ lies on line ℓ_6
 418 : $P_{241023} = (62, 52, 57, 1)$ lies on line ℓ_3
 419 : $P_{241031} = (6, 53, 57, 1)$ lies on line ℓ_3
 420 : $P_{241076} = (51, 53, 57, 1)$ lies on line ℓ_6
 421 : $P_{241114} = (25, 54, 57, 1)$ lies on line ℓ_6
 422 : $P_{241136} = (47, 54, 57, 1)$ lies on line ℓ_3
 423 : $P_{241176} = (23, 55, 57, 1)$ lies on line ℓ_3
 424 : $P_{241185} = (32, 55, 57, 1)$ lies on line ℓ_6
 425 : $P_{241218} = (1, 56, 57, 1)$ lies on line ℓ_6
 426 : $P_{241274} = (57, 56, 57, 1)$ lies on line ℓ_3
 427 : $P_{241282} = (1, 57, 57, 1)$ lies on line ℓ_3
 428 : $P_{241337} = (56, 57, 57, 1)$ lies on line ℓ_6
 429 : $P_{241363} = (18, 58, 57, 1)$ lies on line ℓ_6
 430 : $P_{241385} = (40, 58, 57, 1)$ lies on line ℓ_3
 431 : $P_{241425} = (16, 59, 57, 1)$ lies on line ℓ_3
 432 : $P_{241452} = (43, 59, 57, 1)$ lies on line ℓ_6
 433 : $P_{241500} = (27, 60, 57, 1)$ lies on line ℓ_3
 434 : $P_{241512} = (39, 60, 57, 1)$ lies on line ℓ_6
 435 : $P_{241567} = (30, 61, 57, 1)$ lies on line ℓ_6
 436 : $P_{241572} = (35, 61, 57, 1)$ lies on line ℓ_3
 437 : $P_{241611} = (10, 62, 57, 1)$ lies on line ℓ_3
 438 : $P_{241653} = (52, 62, 57, 1)$ lies on line ℓ_6
 439 : $P_{241678} = (13, 63, 57, 1)$ lies on line ℓ_6
 440 : $P_{241715} = (50, 63, 57, 1)$ lies on line ℓ_3

The single points on the surface are:

Points on surface but on no line

The surface has 3843 points not on any line:
Too many to print.

Line Intersection Graph

	0	1	2	3	4	5	6
0	0	1	1	1	1	1	1
1	1	0	1	1	1	0	0
2	1	1	0	1	0	1	0
3	1	1	1	0	0	0	1
4	1	1	0	0	0	1	1
5	1	0	1	0	1	0	1
6	1	0	0	1	1	1	0

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_4	ℓ_5	ℓ_6
in point	P_{60}	P_{60}	P_{60}	P_{61}	P_{61}	P_{61}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4
in point	P_{60}	P_{60}	P_{60}	P_{8258}

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_3	ℓ_5
in point	P_{60}	P_{60}	P_{60}	P_{233537}

Line 3 intersects

Line	ℓ_0	ℓ_1	ℓ_2	ℓ_6
in point	P_{60}	P_{60}	P_{60}	P_{237633}

Line 4 intersects

Line	ℓ_0	ℓ_1	ℓ_5	ℓ_6
in point	P_{61}	P_{8258}	P_{61}	P_{61}

Line 5 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_6
in point	P_{61}	P_{233537}	P_{61}	P_{61}

Line 6 intersects

Line	ℓ_0	ℓ_3	ℓ_4	ℓ_5
in point	P_{61}	P_{237633}	P_{61}	P_{61}

The surface has 4289 points:

Too many to print.