

Rank-74500 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

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

The point rank of the equation over GF(64) is 1090785350

General information

Number of lines	7
Number of points	4289
Number of singular points	2
Number of Eckardt points	1
Number of double points	5
Number of single points	438
Number of points off lines	3844
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^7
Type of lines on points	$4, 3, 2^5, 1^{438}, 0^{3844}$

Singular Points

The surface has 2 singular points:

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

$$1 : P_{4163} = \mathbf{P}(1, 0, 0, 1) = \mathbf{P}(1, 0, 0, 1)$$

The 7 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{17043457} = \begin{bmatrix} 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{17043457} = \mathbf{Pl}(0, 0, 0, 1, 0, 1)_{278529}$$

$$\begin{aligned}
\ell_1 &= \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}_{17047616} = \mathbf{Pl}(0, 1, 0, 0, 0, 0)_1 \\
\ell_2 &= \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{270400} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{270400} = \mathbf{Pl}(0, 1, 1, 0, 0, 0)_{66} \\
\ell_3 &= \begin{bmatrix} 1 & 1 & 0 & \epsilon^{21} \\ 0 & 0 & 1 & 0 \end{bmatrix}_{15187585} = \begin{bmatrix} 1 & 1 & 0 & 57 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{15187585} = \mathbf{Pl}(0, 57, 1, 0, 0, 1)_{270648} \\
\ell_4 &= \begin{bmatrix} 1 & 1 & 0 & \epsilon^{42} \\ 0 & 0 & 1 & 0 \end{bmatrix}_{14921281} = \begin{bmatrix} 1 & 1 & 0 & 56 \\ 0 & 0 & 1 & 0 \end{bmatrix}_{14921281} = \mathbf{Pl}(0, 56, 1, 0, 0, 1)_{270647} \\
\ell_5 &= \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & \epsilon^{21} & \epsilon^{21} \end{bmatrix}_{270009} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 57 & 57 \end{bmatrix}_{270009} = \mathbf{Pl}(1, 1, 1, 56, 1, 0)_{238649} \\
\ell_6 &= \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & \epsilon^{42} & \epsilon^{42} \end{bmatrix}_{269944} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 56 & 56 \end{bmatrix}_{269944} = \mathbf{Pl}(1, 1, 1, 57, 1, 0)_{242618}
\end{aligned}$$

Rank of lines: (17043457, 17047616, 270400, 15187585, 14921281, 270009, 269944)

Rank of points on Klein quadric: (278529, 1, 66, 270648, 270647, 238649, 242618)

Eckardt Points

The surface has 1 Eckardt points:

$$0 : P_{4163} = \mathbf{P}(1, 0, 0, 1) = \mathbf{P}(1, 0, 0, 1).$$

Double Points

The surface has 5 Double points:

The double points on the surface are:

$$\begin{aligned}
P_{8258} &= (0, 0, 1, 1) = \ell_0 \cap \ell_1 \\
P_{11841} &= (0, 56, 1, 1) = \ell_0 \cap \ell_5 \\
P_{11905} &= (0, 57, 1, 1) = \ell_0 \cap \ell_6
\end{aligned}$$

$$\begin{aligned}
P_{241273} &= (56, 56, 57, 1) = \ell_3 \cap \ell_6 \\
P_{237242} &= (57, 57, 56, 1) = \ell_4 \cap \ell_5
\end{aligned}$$

Single Points

The surface has 438 single points:

The single points on the surface are:

- 0 : $P_1 = (0, 1, 0, 0)$ lies on line ℓ_0
- 1 : $P_3 = (0, 0, 0, 1)$ lies on line ℓ_1
- 2 : $P_{3652} = (1, 56, 1, 0)$ lies on line ℓ_5
- 3 : $P_{3716} = (1, 57, 1, 0)$ lies on line ℓ_6
- 4 : $P_{7802} = (56, 56, 0, 1)$ lies on line ℓ_3
- 5 : $P_{7867} = (57, 57, 0, 1)$ lies on line ℓ_4
- 6 : $P_{8259} = (1, 0, 1, 1)$ lies on line ℓ_2
- 7 : $P_{8322} = (0, 1, 1, 1)$ lies on line ℓ_0
- 8 : $P_{8385} = (0, 2, 1, 1)$ lies on line ℓ_0
- 9 : $P_{8449} = (0, 3, 1, 1)$ lies on line ℓ_0
- 10 : $P_{8513} = (0, 4, 1, 1)$ lies on line ℓ_0
- 11 : $P_{8577} = (0, 5, 1, 1)$ lies on line ℓ_0
- 12 : $P_{8641} = (0, 6, 1, 1)$ lies on line ℓ_0

- 13 : $P_{8705} = (0, 7, 1, 1)$ lies on line ℓ_0
- 14 : $P_{8769} = (0, 8, 1, 1)$ lies on line ℓ_0
- 15 : $P_{8833} = (0, 9, 1, 1)$ lies on line ℓ_0
- 16 : $P_{8897} = (0, 10, 1, 1)$ lies on line ℓ_0
- 17 : $P_{8961} = (0, 11, 1, 1)$ lies on line ℓ_0
- 18 : $P_{9025} = (0, 12, 1, 1)$ lies on line ℓ_0
- 19 : $P_{9089} = (0, 13, 1, 1)$ lies on line ℓ_0
- 20 : $P_{9153} = (0, 14, 1, 1)$ lies on line ℓ_0
- 21 : $P_{9217} = (0, 15, 1, 1)$ lies on line ℓ_0
- 22 : $P_{9281} = (0, 16, 1, 1)$ lies on line ℓ_0
- 23 : $P_{9345} = (0, 17, 1, 1)$ lies on line ℓ_0
- 24 : $P_{9409} = (0, 18, 1, 1)$ lies on line ℓ_0
- 25 : $P_{9473} = (0, 19, 1, 1)$ lies on line ℓ_0

- 26 : $P_{9537} = (0, 20, 1, 1)$ lies on line ℓ_0
 27 : $P_{9601} = (0, 21, 1, 1)$ lies on line ℓ_0
 28 : $P_{9665} = (0, 22, 1, 1)$ lies on line ℓ_0
 29 : $P_{9729} = (0, 23, 1, 1)$ lies on line ℓ_0
 30 : $P_{9793} = (0, 24, 1, 1)$ lies on line ℓ_0
 31 : $P_{9857} = (0, 25, 1, 1)$ lies on line ℓ_0
 32 : $P_{9921} = (0, 26, 1, 1)$ lies on line ℓ_0
 33 : $P_{9985} = (0, 27, 1, 1)$ lies on line ℓ_0
 34 : $P_{10049} = (0, 28, 1, 1)$ lies on line ℓ_0
 35 : $P_{10113} = (0, 29, 1, 1)$ lies on line ℓ_0
 36 : $P_{10177} = (0, 30, 1, 1)$ lies on line ℓ_0
 37 : $P_{10241} = (0, 31, 1, 1)$ lies on line ℓ_0
 38 : $P_{10305} = (0, 32, 1, 1)$ lies on line ℓ_0
 39 : $P_{10369} = (0, 33, 1, 1)$ lies on line ℓ_0
 40 : $P_{10433} = (0, 34, 1, 1)$ lies on line ℓ_0
 41 : $P_{10497} = (0, 35, 1, 1)$ lies on line ℓ_0
 42 : $P_{10561} = (0, 36, 1, 1)$ lies on line ℓ_0
 43 : $P_{10625} = (0, 37, 1, 1)$ lies on line ℓ_0
 44 : $P_{10689} = (0, 38, 1, 1)$ lies on line ℓ_0
 45 : $P_{10753} = (0, 39, 1, 1)$ lies on line ℓ_0
 46 : $P_{10817} = (0, 40, 1, 1)$ lies on line ℓ_0
 47 : $P_{10881} = (0, 41, 1, 1)$ lies on line ℓ_0
 48 : $P_{10945} = (0, 42, 1, 1)$ lies on line ℓ_0
 49 : $P_{11009} = (0, 43, 1, 1)$ lies on line ℓ_0
 50 : $P_{11073} = (0, 44, 1, 1)$ lies on line ℓ_0
 51 : $P_{11137} = (0, 45, 1, 1)$ lies on line ℓ_0
 52 : $P_{11201} = (0, 46, 1, 1)$ lies on line ℓ_0
 53 : $P_{11265} = (0, 47, 1, 1)$ lies on line ℓ_0
 54 : $P_{11329} = (0, 48, 1, 1)$ lies on line ℓ_0
 55 : $P_{11393} = (0, 49, 1, 1)$ lies on line ℓ_0
 56 : $P_{11457} = (0, 50, 1, 1)$ lies on line ℓ_0
 57 : $P_{11521} = (0, 51, 1, 1)$ lies on line ℓ_0
 58 : $P_{11585} = (0, 52, 1, 1)$ lies on line ℓ_0
 59 : $P_{11649} = (0, 53, 1, 1)$ lies on line ℓ_0
 60 : $P_{11713} = (0, 54, 1, 1)$ lies on line ℓ_0
 61 : $P_{11777} = (0, 55, 1, 1)$ lies on line ℓ_0
 62 : $P_{11897} = (56, 56, 1, 1)$ lies on line ℓ_3
 63 : $P_{11962} = (57, 57, 1, 1)$ lies on line ℓ_4
 64 : $P_{11969} = (0, 58, 1, 1)$ lies on line ℓ_0
 65 : $P_{12033} = (0, 59, 1, 1)$ lies on line ℓ_0
 66 : $P_{12097} = (0, 60, 1, 1)$ lies on line ℓ_0
 67 : $P_{12161} = (0, 61, 1, 1)$ lies on line ℓ_0
 68 : $P_{12225} = (0, 62, 1, 1)$ lies on line ℓ_0
 69 : $P_{12289} = (0, 63, 1, 1)$ lies on line ℓ_0
 70 : $P_{12353} = (0, 0, 2, 1)$ lies on line ℓ_1
 71 : $P_{12354} = (1, 0, 2, 1)$ lies on line ℓ_2
 72 : $P_{13444} = (3, 17, 2, 1)$ lies on line ℓ_5
 73 : $P_{13572} = (3, 19, 2, 1)$ lies on line ℓ_6
 74 : $P_{15993} = (56, 56, 2, 1)$ lies on line ℓ_3
 75 : $P_{16058} = (57, 57, 2, 1)$ lies on line ℓ_4
 76 : $P_{16449} = (0, 0, 3, 1)$ lies on line ℓ_1
 77 : $P_{16450} = (1, 0, 3, 1)$ lies on line ℓ_2
 78 : $P_{19075} = (2, 41, 3, 1)$ lies on line ℓ_5
 79 : $P_{19139} = (2, 42, 3, 1)$ lies on line ℓ_6
 80 : $P_{20089} = (56, 56, 3, 1)$ lies on line ℓ_3
 81 : $P_{20154} = (57, 57, 3, 1)$ lies on line ℓ_4
 82 : $P_{20545} = (0, 0, 4, 1)$ lies on line ℓ_1
 83 : $P_{20546} = (1, 0, 4, 1)$ lies on line ℓ_2
 84 : $P_{22726} = (5, 34, 4, 1)$ lies on line ℓ_5
 85 : $P_{22982} = (5, 38, 4, 1)$ lies on line ℓ_6
 86 : $P_{24185} = (56, 56, 4, 1)$ lies on line ℓ_3
 87 : $P_{24250} = (57, 57, 4, 1)$ lies on line ℓ_4
 88 : $P_{24641} = (0, 0, 5, 1)$ lies on line ℓ_1
 89 : $P_{24642} = (1, 0, 5, 1)$ lies on line ℓ_2
 90 : $P_{26309} = (4, 26, 5, 1)$ lies on line ℓ_5
 91 : $P_{26629} = (4, 31, 5, 1)$ lies on line ℓ_6
 92 : $P_{28281} = (56, 56, 5, 1)$ lies on line ℓ_3
 93 : $P_{28346} = (57, 57, 5, 1)$ lies on line ℓ_4
 94 : $P_{28737} = (0, 0, 6, 1)$ lies on line ℓ_1
 95 : $P_{28738} = (1, 0, 6, 1)$ lies on line ℓ_2
 96 : $P_{32008} = (7, 51, 6, 1)$ lies on line ℓ_5
 97 : $P_{32136} = (7, 53, 6, 1)$ lies on line ℓ_6
 98 : $P_{32377} = (56, 56, 6, 1)$ lies on line ℓ_3
 99 : $P_{32442} = (57, 57, 6, 1)$ lies on line ℓ_4
 100 : $P_{32833} = (0, 0, 7, 1)$ lies on line ℓ_1
 101 : $P_{32834} = (1, 0, 7, 1)$ lies on line ℓ_2
 102 : $P_{33543} = (6, 11, 7, 1)$ lies on line ℓ_5
 103 : $P_{33607} = (6, 12, 7, 1)$ lies on line ℓ_6
 104 : $P_{36473} = (56, 56, 7, 1)$ lies on line ℓ_3
 105 : $P_{36538} = (57, 57, 7, 1)$ lies on line ℓ_4
 106 : $P_{36929} = (0, 0, 8, 1)$ lies on line ℓ_1
 107 : $P_{36930} = (1, 0, 8, 1)$ lies on line ℓ_2
 108 : $P_{39306} = (9, 37, 8, 1)$ lies on line ℓ_5
 109 : $P_{39818} = (9, 45, 8, 1)$ lies on line ℓ_6
 110 : $P_{40569} = (56, 56, 8, 1)$ lies on line ℓ_3
 111 : $P_{40634} = (57, 57, 8, 1)$ lies on line ℓ_4
 112 : $P_{41025} = (0, 0, 9, 1)$ lies on line ℓ_1
 113 : $P_{41026} = (1, 0, 9, 1)$ lies on line ℓ_2
 114 : $P_{42313} = (8, 20, 9, 1)$ lies on line ℓ_6
 115 : $P_{42889} = (8, 29, 9, 1)$ lies on line ℓ_5
 116 : $P_{44665} = (56, 56, 9, 1)$ lies on line ℓ_3
 117 : $P_{44730} = (57, 57, 9, 1)$ lies on line ℓ_4
 118 : $P_{45121} = (0, 0, 10, 1)$ lies on line ℓ_1
 119 : $P_{45122} = (1, 0, 10, 1)$ lies on line ℓ_2
 120 : $P_{48460} = (11, 52, 10, 1)$ lies on line ℓ_5
 121 : $P_{48761} = (56, 56, 10, 1)$ lies on line ℓ_3
 122 : $P_{48826} = (57, 57, 10, 1)$ lies on line ℓ_4
 123 : $P_{49100} = (11, 62, 10, 1)$ lies on line ℓ_6
 124 : $P_{49217} = (0, 0, 11, 1)$ lies on line ℓ_1
 125 : $P_{49218} = (1, 0, 11, 1)$ lies on line ℓ_2
 126 : $P_{49675} = (10, 7, 11, 1)$ lies on line ℓ_6
 127 : $P_{49995} = (10, 12, 11, 1)$ lies on line ℓ_5
 128 : $P_{52857} = (56, 56, 11, 1)$ lies on line ℓ_3
 129 : $P_{52922} = (57, 57, 11, 1)$ lies on line ℓ_4
 130 : $P_{53313} = (0, 0, 12, 1)$ lies on line ℓ_1
 131 : $P_{53314} = (1, 0, 12, 1)$ lies on line ℓ_2
 132 : $P_{53774} = (13, 7, 12, 1)$ lies on line ℓ_5
 133 : $P_{54030} = (13, 11, 12, 1)$ lies on line ℓ_6

134 : $P_{56953} = (56, 56, 12, 1)$ lies on line ℓ_3
 135 : $P_{57018} = (57, 57, 12, 1)$ lies on line ℓ_4
 136 : $P_{57409} = (0, 0, 13, 1)$ lies on line ℓ_1
 137 : $P_{57410} = (1, 0, 13, 1)$ lies on line ℓ_2
 138 : $P_{60621} = (12, 50, 13, 1)$ lies on line ℓ_6
 139 : $P_{61049} = (56, 56, 13, 1)$ lies on line ℓ_3
 140 : $P_{61114} = (57, 57, 13, 1)$ lies on line ℓ_4
 141 : $P_{61453} = (12, 63, 13, 1)$ lies on line ℓ_5
 142 : $P_{61505} = (0, 0, 14, 1)$ lies on line ℓ_1
 143 : $P_{61506} = (1, 0, 14, 1)$ lies on line ℓ_2
 144 : $P_{62928} = (15, 22, 14, 1)$ lies on line ℓ_5
 145 : $P_{63056} = (15, 24, 14, 1)$ lies on line ℓ_6
 146 : $P_{65145} = (56, 56, 14, 1)$ lies on line ℓ_3
 147 : $P_{65210} = (57, 57, 14, 1)$ lies on line ℓ_4
 148 : $P_{65601} = (0, 0, 15, 1)$ lies on line ℓ_1
 149 : $P_{65602} = (1, 0, 15, 1)$ lies on line ℓ_2
 150 : $P_{67727} = (14, 33, 15, 1)$ lies on line ℓ_6
 151 : $P_{68559} = (14, 46, 15, 1)$ lies on line ℓ_5
 152 : $P_{69241} = (56, 56, 15, 1)$ lies on line ℓ_3
 153 : $P_{69306} = (57, 57, 15, 1)$ lies on line ℓ_4
 154 : $P_{69697} = (0, 0, 16, 1)$ lies on line ℓ_1
 155 : $P_{69698} = (1, 0, 16, 1)$ lies on line ℓ_2
 156 : $P_{72466} = (17, 43, 16, 1)$ lies on line ℓ_5
 157 : $P_{73337} = (56, 56, 16, 1)$ lies on line ℓ_3
 158 : $P_{73402} = (57, 57, 16, 1)$ lies on line ℓ_4
 159 : $P_{73490} = (17, 59, 16, 1)$ lies on line ℓ_6
 160 : $P_{73793} = (0, 0, 17, 1)$ lies on line ℓ_1
 161 : $P_{73794} = (1, 0, 17, 1)$ lies on line ℓ_2
 162 : $P_{73937} = (16, 2, 17, 1)$ lies on line ℓ_6
 163 : $P_{75025} = (16, 19, 17, 1)$ lies on line ℓ_5
 164 : $P_{77433} = (56, 56, 17, 1)$ lies on line ℓ_3
 165 : $P_{77498} = (57, 57, 17, 1)$ lies on line ℓ_4
 166 : $P_{77889} = (0, 0, 18, 1)$ lies on line ℓ_1
 167 : $P_{77890} = (1, 0, 18, 1)$ lies on line ℓ_2
 168 : $P_{80468} = (19, 40, 18, 1)$ lies on line ℓ_6
 169 : $P_{81529} = (56, 56, 18, 1)$ lies on line ℓ_3
 170 : $P_{81594} = (57, 57, 18, 1)$ lies on line ℓ_4
 171 : $P_{81620} = (19, 58, 18, 1)$ lies on line ℓ_5
 172 : $P_{81985} = (0, 0, 19, 1)$ lies on line ℓ_1
 173 : $P_{81986} = (1, 0, 19, 1)$ lies on line ℓ_2
 174 : $P_{82131} = (18, 2, 19, 1)$ lies on line ℓ_5
 175 : $P_{83091} = (18, 17, 19, 1)$ lies on line ℓ_6
 176 : $P_{85625} = (56, 56, 19, 1)$ lies on line ℓ_3
 177 : $P_{85690} = (57, 57, 19, 1)$ lies on line ℓ_4
 178 : $P_{86081} = (0, 0, 20, 1)$ lies on line ℓ_1
 179 : $P_{86082} = (1, 0, 20, 1)$ lies on line ℓ_2
 180 : $P_{86678} = (21, 9, 20, 1)$ lies on line ℓ_5
 181 : $P_{87958} = (21, 29, 20, 1)$ lies on line ℓ_6
 182 : $P_{89721} = (56, 56, 20, 1)$ lies on line ℓ_3
 183 : $P_{89786} = (57, 57, 20, 1)$ lies on line ℓ_4
 184 : $P_{90177} = (0, 0, 21, 1)$ lies on line ℓ_1
 185 : $P_{90178} = (1, 0, 21, 1)$ lies on line ℓ_2
 186 : $P_{92501} = (20, 36, 21, 1)$ lies on line ℓ_6
 187 : $P_{93333} = (20, 49, 21, 1)$ lies on line ℓ_5
 188 : $P_{93817} = (56, 56, 21, 1)$ lies on line ℓ_3
 189 : $P_{93882} = (57, 57, 21, 1)$ lies on line ℓ_4
 190 : $P_{94273} = (0, 0, 22, 1)$ lies on line ℓ_1
 191 : $P_{94274} = (1, 0, 22, 1)$ lies on line ℓ_2
 192 : $P_{95192} = (23, 14, 22, 1)$ lies on line ℓ_6
 193 : $P_{95832} = (23, 24, 22, 1)$ lies on line ℓ_5
 194 : $P_{97913} = (56, 56, 22, 1)$ lies on line ℓ_3
 195 : $P_{97978} = (57, 57, 22, 1)$ lies on line ℓ_4
 196 : $P_{98369} = (0, 0, 23, 1)$ lies on line ℓ_1
 197 : $P_{98370} = (1, 0, 23, 1)$ lies on line ℓ_2
 198 : $P_{100439} = (22, 32, 23, 1)$ lies on line ℓ_5
 199 : $P_{101911} = (22, 55, 23, 1)$ lies on line ℓ_6
 200 : $P_{102009} = (56, 56, 23, 1)$ lies on line ℓ_3
 201 : $P_{102074} = (57, 57, 23, 1)$ lies on line ℓ_4
 202 : $P_{102465} = (0, 0, 24, 1)$ lies on line ℓ_1
 203 : $P_{102466} = (1, 0, 24, 1)$ lies on line ℓ_2
 204 : $P_{103386} = (25, 14, 24, 1)$ lies on line ℓ_5
 205 : $P_{103898} = (25, 22, 24, 1)$ lies on line ℓ_6
 206 : $P_{106105} = (56, 56, 24, 1)$ lies on line ℓ_3
 207 : $P_{106170} = (57, 57, 24, 1)$ lies on line ℓ_4
 208 : $P_{106561} = (0, 0, 25, 1)$ lies on line ℓ_1
 209 : $P_{106562} = (1, 0, 25, 1)$ lies on line ℓ_2
 210 : $P_{109593} = (24, 47, 25, 1)$ lies on line ℓ_6
 211 : $P_{110041} = (24, 54, 25, 1)$ lies on line ℓ_5
 212 : $P_{110201} = (56, 56, 25, 1)$ lies on line ℓ_3
 213 : $P_{110266} = (57, 57, 25, 1)$ lies on line ℓ_4
 214 : $P_{110657} = (0, 0, 26, 1)$ lies on line ℓ_1
 215 : $P_{110658} = (1, 0, 26, 1)$ lies on line ℓ_2
 216 : $P_{111004} = (27, 5, 26, 1)$ lies on line ℓ_6
 217 : $P_{112668} = (27, 31, 26, 1)$ lies on line ℓ_5
 218 : $P_{114297} = (56, 56, 26, 1)$ lies on line ℓ_3
 219 : $P_{114362} = (57, 57, 26, 1)$ lies on line ℓ_4
 220 : $P_{114753} = (0, 0, 27, 1)$ lies on line ℓ_1
 221 : $P_{114754} = (1, 0, 27, 1)$ lies on line ℓ_2
 222 : $P_{117275} = (26, 39, 27, 1)$ lies on line ℓ_5
 223 : $P_{118393} = (56, 56, 27, 1)$ lies on line ℓ_3
 224 : $P_{118458} = (57, 57, 27, 1)$ lies on line ℓ_4
 225 : $P_{118619} = (26, 60, 27, 1)$ lies on line ℓ_6
 226 : $P_{118849} = (0, 0, 28, 1)$ lies on line ℓ_1
 227 : $P_{118850} = (1, 0, 28, 1)$ lies on line ℓ_2
 228 : $P_{121694} = (29, 44, 28, 1)$ lies on line ℓ_5
 229 : $P_{121950} = (29, 48, 28, 1)$ lies on line ℓ_6
 230 : $P_{122489} = (56, 56, 28, 1)$ lies on line ℓ_3
 231 : $P_{122554} = (57, 57, 28, 1)$ lies on line ℓ_4
 232 : $P_{122945} = (0, 0, 29, 1)$ lies on line ℓ_1
 233 : $P_{122946} = (1, 0, 29, 1)$ lies on line ℓ_2
 234 : $P_{123549} = (28, 9, 29, 1)$ lies on line ℓ_6
 235 : $P_{124253} = (28, 20, 29, 1)$ lies on line ℓ_5
 236 : $P_{126585} = (56, 56, 29, 1)$ lies on line ℓ_3
 237 : $P_{126650} = (57, 57, 29, 1)$ lies on line ℓ_4
 238 : $P_{127041} = (0, 0, 30, 1)$ lies on line ℓ_1
 239 : $P_{127042} = (1, 0, 30, 1)$ lies on line ℓ_2
 240 : $P_{129312} = (31, 35, 30, 1)$ lies on line ℓ_6
 241 : $P_{130681} = (56, 56, 30, 1)$ lies on line ℓ_3

242 : $P_{130746} = (57, 57, 30, 1)$ lies on line ℓ_4
 243 : $P_{130976} = (31, 61, 30, 1)$ lies on line ℓ_5
 244 : $P_{131137} = (0, 0, 31, 1)$ lies on line ℓ_1
 245 : $P_{131138} = (1, 0, 31, 1)$ lies on line ℓ_2
 246 : $P_{131487} = (30, 5, 31, 1)$ lies on line ℓ_5
 247 : $P_{132831} = (30, 26, 31, 1)$ lies on line ℓ_6
 248 : $P_{134777} = (56, 56, 31, 1)$ lies on line ℓ_3
 249 : $P_{134842} = (57, 57, 31, 1)$ lies on line ℓ_4
 250 : $P_{135233} = (0, 0, 32, 1)$ lies on line ℓ_1
 251 : $P_{135234} = (1, 0, 32, 1)$ lies on line ℓ_2
 252 : $P_{136738} = (33, 23, 32, 1)$ lies on line ℓ_6
 253 : $P_{138786} = (33, 55, 32, 1)$ lies on line ℓ_5
 254 : $P_{138873} = (56, 56, 32, 1)$ lies on line ℓ_3
 255 : $P_{138938} = (57, 57, 32, 1)$ lies on line ℓ_4
 256 : $P_{139329} = (0, 0, 33, 1)$ lies on line ℓ_1
 257 : $P_{139330} = (1, 0, 33, 1)$ lies on line ℓ_2
 258 : $P_{140321} = (32, 15, 33, 1)$ lies on line ℓ_5
 259 : $P_{142305} = (32, 46, 33, 1)$ lies on line ℓ_6
 260 : $P_{142969} = (56, 56, 33, 1)$ lies on line ℓ_3
 261 : $P_{143034} = (57, 57, 33, 1)$ lies on line ℓ_4
 262 : $P_{143425} = (0, 0, 34, 1)$ lies on line ℓ_1
 263 : $P_{143426} = (1, 0, 34, 1)$ lies on line ℓ_2
 264 : $P_{143716} = (35, 4, 34, 1)$ lies on line ℓ_6
 265 : $P_{145892} = (35, 38, 34, 1)$ lies on line ℓ_5
 266 : $P_{147065} = (56, 56, 34, 1)$ lies on line ℓ_3
 267 : $P_{147130} = (57, 57, 34, 1)$ lies on line ℓ_4
 268 : $P_{147521} = (0, 0, 35, 1)$ lies on line ℓ_1
 269 : $P_{147522} = (1, 0, 35, 1)$ lies on line ℓ_2
 270 : $P_{149475} = (34, 30, 35, 1)$ lies on line ℓ_5
 271 : $P_{151161} = (56, 56, 35, 1)$ lies on line ℓ_3
 272 : $P_{151226} = (57, 57, 35, 1)$ lies on line ℓ_4
 273 : $P_{151459} = (34, 61, 35, 1)$ lies on line ℓ_6
 274 : $P_{151617} = (0, 0, 36, 1)$ lies on line ℓ_1
 275 : $P_{151618} = (1, 0, 36, 1)$ lies on line ℓ_2
 276 : $P_{152998} = (37, 21, 36, 1)$ lies on line ℓ_5
 277 : $P_{154790} = (37, 49, 36, 1)$ lies on line ℓ_6
 278 : $P_{155257} = (56, 56, 36, 1)$ lies on line ℓ_3
 279 : $P_{155322} = (57, 57, 36, 1)$ lies on line ℓ_4
 280 : $P_{155713} = (0, 0, 37, 1)$ lies on line ℓ_1
 281 : $P_{155714} = (1, 0, 37, 1)$ lies on line ℓ_2
 282 : $P_{156261} = (36, 8, 37, 1)$ lies on line ℓ_6
 283 : $P_{158629} = (36, 45, 37, 1)$ lies on line ℓ_5
 284 : $P_{159353} = (56, 56, 37, 1)$ lies on line ℓ_3
 285 : $P_{159418} = (57, 57, 37, 1)$ lies on line ℓ_4
 286 : $P_{159809} = (0, 0, 38, 1)$ lies on line ℓ_1
 287 : $P_{159810} = (1, 0, 38, 1)$ lies on line ℓ_2
 288 : $P_{160104} = (39, 4, 38, 1)$ lies on line ℓ_5
 289 : $P_{162024} = (39, 34, 38, 1)$ lies on line ℓ_6
 290 : $P_{163449} = (56, 56, 38, 1)$ lies on line ℓ_3
 291 : $P_{163514} = (57, 57, 38, 1)$ lies on line ℓ_4
 292 : $P_{163905} = (0, 0, 39, 1)$ lies on line ℓ_1
 293 : $P_{163906} = (1, 0, 39, 1)$ lies on line ℓ_2
 294 : $P_{165671} = (38, 27, 39, 1)$ lies on line ℓ_6
 295 : $P_{167545} = (56, 56, 39, 1)$ lies on line ℓ_3

296 : $P_{167610} = (57, 57, 39, 1)$ lies on line ℓ_4
 297 : $P_{167783} = (38, 60, 39, 1)$ lies on line ℓ_5
 298 : $P_{168001} = (0, 0, 40, 1)$ lies on line ℓ_1
 299 : $P_{168002} = (1, 0, 40, 1)$ lies on line ℓ_2
 300 : $P_{169194} = (41, 18, 40, 1)$ lies on line ℓ_5
 301 : $P_{171641} = (56, 56, 40, 1)$ lies on line ℓ_3
 302 : $P_{171706} = (57, 57, 40, 1)$ lies on line ℓ_4
 303 : $P_{171754} = (41, 58, 40, 1)$ lies on line ℓ_6
 304 : $P_{172097} = (0, 0, 41, 1)$ lies on line ℓ_1
 305 : $P_{172098} = (1, 0, 41, 1)$ lies on line ℓ_2
 306 : $P_{172329} = (40, 3, 41, 1)$ lies on line ℓ_6
 307 : $P_{174825} = (40, 42, 41, 1)$ lies on line ℓ_5
 308 : $P_{175737} = (56, 56, 41, 1)$ lies on line ℓ_3
 309 : $P_{175802} = (57, 57, 41, 1)$ lies on line ℓ_4
 310 : $P_{176193} = (0, 0, 42, 1)$ lies on line ℓ_1
 311 : $P_{176194} = (1, 0, 42, 1)$ lies on line ℓ_2
 312 : $P_{176428} = (43, 3, 42, 1)$ lies on line ℓ_5
 313 : $P_{178860} = (43, 41, 42, 1)$ lies on line ℓ_6
 314 : $P_{179833} = (56, 56, 42, 1)$ lies on line ℓ_3
 315 : $P_{179898} = (57, 57, 42, 1)$ lies on line ℓ_4
 316 : $P_{180289} = (0, 0, 43, 1)$ lies on line ℓ_1
 317 : $P_{180290} = (1, 0, 43, 1)$ lies on line ℓ_2
 318 : $P_{181355} = (42, 16, 43, 1)$ lies on line ℓ_6
 319 : $P_{183929} = (56, 56, 43, 1)$ lies on line ℓ_3
 320 : $P_{183994} = (57, 57, 43, 1)$ lies on line ℓ_4
 321 : $P_{184107} = (42, 59, 43, 1)$ lies on line ℓ_5
 322 : $P_{184385} = (0, 0, 44, 1)$ lies on line ℓ_1
 323 : $P_{184386} = (1, 0, 44, 1)$ lies on line ℓ_2
 324 : $P_{186222} = (45, 28, 44, 1)$ lies on line ℓ_6
 325 : $P_{187502} = (45, 48, 44, 1)$ lies on line ℓ_5
 326 : $P_{188025} = (56, 56, 44, 1)$ lies on line ℓ_3
 327 : $P_{188090} = (57, 57, 44, 1)$ lies on line ℓ_4
 328 : $P_{188481} = (0, 0, 45, 1)$ lies on line ℓ_1
 329 : $P_{188482} = (1, 0, 45, 1)$ lies on line ℓ_2
 330 : $P_{189037} = (44, 8, 45, 1)$ lies on line ℓ_5
 331 : $P_{190893} = (44, 37, 45, 1)$ lies on line ℓ_6
 332 : $P_{192121} = (56, 56, 45, 1)$ lies on line ℓ_3
 333 : $P_{192186} = (57, 57, 45, 1)$ lies on line ℓ_4
 334 : $P_{192577} = (0, 0, 46, 1)$ lies on line ℓ_1
 335 : $P_{192578} = (1, 0, 46, 1)$ lies on line ℓ_2
 336 : $P_{193584} = (47, 15, 46, 1)$ lies on line ℓ_6
 337 : $P_{194736} = (47, 33, 46, 1)$ lies on line ℓ_5
 338 : $P_{196217} = (56, 56, 46, 1)$ lies on line ℓ_3
 339 : $P_{196282} = (57, 57, 46, 1)$ lies on line ℓ_4
 340 : $P_{196673} = (0, 0, 47, 1)$ lies on line ℓ_1
 341 : $P_{196674} = (1, 0, 47, 1)$ lies on line ℓ_2
 342 : $P_{198319} = (46, 25, 47, 1)$ lies on line ℓ_5
 343 : $P_{200175} = (46, 54, 47, 1)$ lies on line ℓ_6
 344 : $P_{200313} = (56, 56, 47, 1)$ lies on line ℓ_3
 345 : $P_{200378} = (57, 57, 47, 1)$ lies on line ℓ_4
 346 : $P_{200769} = (0, 0, 48, 1)$ lies on line ℓ_1
 347 : $P_{200770} = (1, 0, 48, 1)$ lies on line ℓ_2
 348 : $P_{202610} = (49, 28, 48, 1)$ lies on line ℓ_5
 349 : $P_{203634} = (49, 44, 48, 1)$ lies on line ℓ_6

350 : $P_{204409} = (56, 56, 48, 1)$ lies on line ℓ_3
 351 : $P_{204474} = (57, 57, 48, 1)$ lies on line ℓ_4
 352 : $P_{204865} = (0, 0, 49, 1)$ lies on line ℓ_1
 353 : $P_{204866} = (1, 0, 49, 1)$ lies on line ℓ_2
 354 : $P_{206257} = (48, 21, 49, 1)$ lies on line ℓ_6
 355 : $P_{207217} = (48, 36, 49, 1)$ lies on line ℓ_5
 356 : $P_{208505} = (56, 56, 49, 1)$ lies on line ℓ_3
 357 : $P_{208570} = (57, 57, 49, 1)$ lies on line ℓ_4
 358 : $P_{208961} = (0, 0, 50, 1)$ lies on line ℓ_1
 359 : $P_{208962} = (1, 0, 50, 1)$ lies on line ℓ_2
 360 : $P_{209844} = (51, 13, 50, 1)$ lies on line ℓ_5
 361 : $P_{212601} = (56, 56, 50, 1)$ lies on line ℓ_3
 362 : $P_{212666} = (57, 57, 50, 1)$ lies on line ℓ_4
 363 : $P_{213044} = (51, 63, 50, 1)$ lies on line ℓ_6
 364 : $P_{213057} = (0, 0, 51, 1)$ lies on line ℓ_1
 365 : $P_{213058} = (1, 0, 51, 1)$ lies on line ℓ_2
 366 : $P_{213491} = (50, 6, 51, 1)$ lies on line ℓ_6
 367 : $P_{216499} = (50, 53, 51, 1)$ lies on line ℓ_5
 368 : $P_{216697} = (56, 56, 51, 1)$ lies on line ℓ_3
 369 : $P_{216762} = (57, 57, 51, 1)$ lies on line ℓ_4
 370 : $P_{217153} = (0, 0, 52, 1)$ lies on line ℓ_1
 371 : $P_{217154} = (1, 0, 52, 1)$ lies on line ℓ_2
 372 : $P_{217846} = (53, 10, 52, 1)$ lies on line ℓ_6
 373 : $P_{220793} = (56, 56, 52, 1)$ lies on line ℓ_3
 374 : $P_{220858} = (57, 57, 52, 1)$ lies on line ℓ_4
 375 : $P_{221174} = (53, 62, 52, 1)$ lies on line ℓ_5
 376 : $P_{221249} = (0, 0, 53, 1)$ lies on line ℓ_1
 377 : $P_{221250} = (1, 0, 53, 1)$ lies on line ℓ_2
 378 : $P_{221685} = (52, 6, 53, 1)$ lies on line ℓ_5
 379 : $P_{224565} = (52, 51, 53, 1)$ lies on line ℓ_6
 380 : $P_{224889} = (56, 56, 53, 1)$ lies on line ℓ_3
 381 : $P_{224954} = (57, 57, 53, 1)$ lies on line ℓ_4
 382 : $P_{225345} = (0, 0, 54, 1)$ lies on line ℓ_1
 383 : $P_{225346} = (1, 0, 54, 1)$ lies on line ℓ_2
 384 : $P_{227000} = (55, 25, 54, 1)$ lies on line ℓ_6
 385 : $P_{228408} = (55, 47, 54, 1)$ lies on line ℓ_5
 386 : $P_{228985} = (56, 56, 54, 1)$ lies on line ℓ_3
 387 : $P_{229050} = (57, 57, 54, 1)$ lies on line ℓ_4
 388 : $P_{229441} = (0, 0, 55, 1)$ lies on line ℓ_1
 389 : $P_{229442} = (1, 0, 55, 1)$ lies on line ℓ_2
 390 : $P_{230967} = (54, 23, 55, 1)$ lies on line ℓ_5
 391 : $P_{231543} = (54, 32, 55, 1)$ lies on line ℓ_6
 392 : $P_{233081} = (56, 56, 55, 1)$ lies on line ℓ_3
 393 : $P_{233146} = (57, 57, 55, 1)$ lies on line ℓ_4
 394 : $P_{233537} = (0, 0, 56, 1)$ lies on line ℓ_1
 395 : $P_{233538} = (1, 0, 56, 1)$ lies on line ℓ_2
 396 : $P_{233658} = (57, 1, 56, 1)$ lies on line ℓ_6
 397 : $P_{237177} = (56, 56, 56, 1)$ lies on line ℓ_3
 398 : $P_{237633} = (0, 0, 57, 1)$ lies on line ℓ_1
 399 : $P_{237634} = (1, 0, 57, 1)$ lies on line ℓ_2
 400 : $P_{237753} = (56, 1, 57, 1)$ lies on line ℓ_5
 401 : $P_{241338} = (57, 57, 57, 1)$ lies on line ℓ_4
 402 : $P_{241729} = (0, 0, 58, 1)$ lies on line ℓ_1
 403 : $P_{241730} = (1, 0, 58, 1)$ lies on line ℓ_2
 404 : $P_{242940} = (59, 18, 58, 1)$ lies on line ℓ_6
 405 : $P_{244348} = (59, 40, 58, 1)$ lies on line ℓ_5
 406 : $P_{245369} = (56, 56, 58, 1)$ lies on line ℓ_3
 407 : $P_{245434} = (57, 57, 58, 1)$ lies on line ℓ_4
 408 : $P_{245825} = (0, 0, 59, 1)$ lies on line ℓ_1
 409 : $P_{245826} = (1, 0, 59, 1)$ lies on line ℓ_2
 410 : $P_{246907} = (58, 16, 59, 1)$ lies on line ℓ_5
 411 : $P_{248635} = (58, 43, 59, 1)$ lies on line ℓ_6
 412 : $P_{249465} = (56, 56, 59, 1)$ lies on line ℓ_3
 413 : $P_{249530} = (57, 57, 59, 1)$ lies on line ℓ_4
 414 : $P_{249921} = (0, 0, 60, 1)$ lies on line ℓ_1
 415 : $P_{249922} = (1, 0, 60, 1)$ lies on line ℓ_2
 416 : $P_{251710} = (61, 27, 60, 1)$ lies on line ℓ_5
 417 : $P_{252478} = (61, 39, 60, 1)$ lies on line ℓ_6
 418 : $P_{253561} = (56, 56, 60, 1)$ lies on line ℓ_3
 419 : $P_{253626} = (57, 57, 60, 1)$ lies on line ℓ_4
 420 : $P_{254017} = (0, 0, 61, 1)$ lies on line ℓ_1
 421 : $P_{254018} = (1, 0, 61, 1)$ lies on line ℓ_2
 422 : $P_{255997} = (60, 30, 61, 1)$ lies on line ℓ_6
 423 : $P_{256317} = (60, 35, 61, 1)$ lies on line ℓ_5
 424 : $P_{257657} = (56, 56, 61, 1)$ lies on line ℓ_3
 425 : $P_{257722} = (57, 57, 61, 1)$ lies on line ℓ_4
 426 : $P_{258113} = (0, 0, 62, 1)$ lies on line ℓ_1
 427 : $P_{258114} = (1, 0, 62, 1)$ lies on line ℓ_2
 428 : $P_{258816} = (63, 10, 62, 1)$ lies on line ℓ_5
 429 : $P_{261504} = (63, 52, 62, 1)$ lies on line ℓ_6
 430 : $P_{261753} = (56, 56, 62, 1)$ lies on line ℓ_3
 431 : $P_{261818} = (57, 57, 62, 1)$ lies on line ℓ_4
 432 : $P_{262209} = (0, 0, 63, 1)$ lies on line ℓ_1
 433 : $P_{262210} = (1, 0, 63, 1)$ lies on line ℓ_2
 434 : $P_{263103} = (62, 13, 63, 1)$ lies on line ℓ_6
 435 : $P_{265471} = (62, 50, 63, 1)$ lies on line ℓ_5
 436 : $P_{265849} = (56, 56, 63, 1)$ lies on line ℓ_3
 437 : $P_{265914} = (57, 57, 63, 1)$ lies on line ℓ_4

The single points on the surface are:

Points on surface but on no line

The surface has 3844 points not on any line:
Too many to print.

Line Intersection Graph

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

Neighbor sets in the line intersection graph:

Line 0 intersects

Line	ℓ_1	ℓ_5	ℓ_6
in point	P_{8258}	P_{11841}	P_{11905}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_4
in point	P_{8258}	P_2	P_2	P_2

Line 2 intersects

Line	ℓ_1	ℓ_3	ℓ_4	ℓ_5	ℓ_6
in point	P_2	P_2	P_2	P_{4163}	P_{4163}

Line 3 intersects

Line	ℓ_1	ℓ_2	ℓ_4	ℓ_6
in point	P_2	P_2	P_2	P_{241273}

Line 4 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_5
in point	P_2	P_2	P_2	P_{237242}

Line 5 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_6
in point	P_{11841}	P_{4163}	P_{237242}	P_{4163}

Line 6 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_5
in point	P_{11905}	P_{4163}	P_{241273}	P_{4163}

The surface has 4289 points:

Too many to print.