Rank-67117 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

$$X_1^3 + X_3^3 + X_0^2X_2 + X_1^2X_3 + X_0X_2^2 + X_0X_1X_2 = 0$$

(0, 1, 0, 1, 0, 1, 0, 0, 0, 1, 1, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is -2130177915

General information

Number of lines	21
Number of points	4481
Number of singular points	1
Number of Eckardt points	3
Number of double points	66
Number of single points	1218
Number of points off lines	3193
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65^{21}
Type of lines on points	6, 3^3, 2^{66}, 1^{1218}, 0^{3193}

Singular Points

The surface has 1 singular points:

$0: \ P_4 = \mathbf{P}(1,1,1,1) = \mathbf{P}(1,1,1,1)$

The 21 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \epsilon^9 \end{bmatrix}_{3008} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 47 \end{bmatrix}_{3008} = \mathbf{Pl}(10,0,0,0,1,0)_{4235}$$

$$\ell_1 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \epsilon^{18} \end{array}\right]_{704} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 11 \end{array}\right]_{704} = \mathbf{Pl}(37,0,0,0,1,0)_{4262}$$

$$\ell_2 = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & \epsilon^{36} \end{array}\right]_{2304} = \left[\begin{array}{cccc} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 36 \end{array}\right]_{2304} = \mathbf{Pl}(46,0,0,0,1,0)_{4271}$$

$$\ell_3 = \left[\begin{array}{cccc} 0 & 1 & 0 & \epsilon^{9} \\ 0 & 0 & 1 & 0 \end{array}\right]_{17046511} = \left[\begin{array}{cccc} 0 & 1 & 0 & 47 \\ 0 & 0 & 1 & 0 \end{array}\right]_{17046511} = \mathbf{Pl}(0,47,0,0,0,1)_{270511}$$

$$\ell_4 = \left[\begin{array}{cccc} 0 & 1 & 0 & \epsilon^{18} \\ 0 & 0 & 1 & 0 \end{array}\right]_{17044171} = \left[\begin{array}{cccc} 0 & 1 & 0 & 11 \\ 0 & 0 & 1 & 0 \end{array}\right]_{17044171} = \mathbf{Pl}(0,11,0,0,0,1)_{270475}$$

$$\ell_5 = \left[\begin{array}{cccc} 0 & 1 & 0 & \epsilon^{36} \\ 0 & 0 & 1 & 0 \end{array}\right]_{17045796} = \left[\begin{array}{cccc} 0 & 1 & 0 & 36 \\ 0 & 0 & 1 & 0 \end{array}\right]_{17045796} = \mathbf{Pl}(0,36,0,0,0,1)_{270500}$$

$$\ell_6 = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & \epsilon^{9} \end{array}\right]_{7170} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 47 \end{array}\right]_{7170} = \mathbf{Pl}(10,47,10,0,47,1)_{12592896}$$

$$\ell_7 = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & \epsilon^{18} \end{array}\right]_{4866} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 11 \end{array}\right]_{4866} = \mathbf{Pl}(37,11,37,0,11,1)_{3159744}$$

$$\ell_8 = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & \epsilon^{36} \end{array}\right]_{6466} = \left[\begin{array}{cccc} 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 36 \end{array}\right]_{6466} = \mathbf{Pl}(46,36,46,0,36,1)_{9712320}$$

$$\ell_9 = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{27} & \epsilon^{54} \\ 0 & 1 & \epsilon^{9} & \epsilon^{18} \end{array}\right]_{2855197} = \left[\begin{array}{cccc} 1 & 0 & 46 & 10 \\ 0 & 1 & 47 & 11 \end{array}\right]_{2855197} = \mathbf{Pl}(10,47,36,46,10,1)_{3048585}$$

$$\ell_{10} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{54} & \epsilon^{45} \\ 0 & 1 & \epsilon^{27} & \epsilon^{9} \end{array}\right]_{9897912} = \left[\begin{array}{cccc} 1 & 0 & 10 & 37 \\ 0 & 1 & 46 & 47 \end{array}\right]_{9897912} = \mathbf{Pl}(46,36,47,10,11,1)_{3355935}$$

$$\ell_{11} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{18} & \epsilon^{45} \\ 0 & 1 & \epsilon^{54} & \epsilon^{36} \end{array}\right]_{9901333} = \left[\begin{array}{cccc} 1 & 0 & 11 & 37 \\ 0 & 1 & 10 & 36 \end{array}\right]_{9901333} = \mathbf{Pl}(10,47,36,46,11,1)_{3312303}$$

$$\ell_{12} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{36} & \epsilon^{27} \\ 0 & 1 & \epsilon^{18} & \epsilon^{18} \end{array}\right]_{12400495} = \left[\begin{array}{cccc} 1 & 0 & 36 & 46 \\ 0 & 1 & 11 & 11 \end{array}\right]_{12400495} = \mathbf{Pl}(46,36,47,10,37,1)_{10167684}$$

$$\ell_{13} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{36} & \epsilon^{27} \\ 0 & 1 & \epsilon^{45} & \epsilon^{9} \end{array}\right]_{12402825} = \left[\begin{array}{cccc} 1 & 0 & 36 & 46 \\ 0 & 1 & 37 & 47 \end{array}\right]_{12402825} = \mathbf{Pl}(37,11,47,10,36,1)_{9907863}$$

$$\ell_{14} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{9} & \epsilon^{54} \\ 0 & 1 & \epsilon^{36} & \epsilon^{36} \end{array}\right]_{2860947} = \left[\begin{array}{cccc} 1 & 0 & 47 & 10 \\ 0 & 1 & 36 & 36 \end{array}\right]_{2860947} = \mathbf{Pl}(10,47,11,37,46,1)_{12387453}$$

$$\ell_{15} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{54} & \epsilon^{45} \\ 0 & 1 & \epsilon^{18} & \epsilon^{36} \end{array}\right]_{9897173} = \left[\begin{array}{cccc} 1 & 0 & 10 & 37 \\ 0 & 1 & 11 & 36 \end{array}\right]_{9897173} = \mathbf{Pl}(37,11,47,10,37,1)_{10169313}$$

$$\ell_{16} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{45} & \epsilon^{27} \\ 0 & 1 & \epsilon^{54} & \epsilon^{18} \end{array}\right]_{12404655} = \left[\begin{array}{cccc} 1 & 0 & 37 & 46 \\ 0 & 1 & 10 & 11 \end{array}\right]_{12404655} = \mathbf{Pl}(10,47,11,37,36,1)_{9765015}$$

$$\ell_{17} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{45} & \epsilon^{27} \\ 0 & 1 & \epsilon^{36} & \epsilon^{9} \end{array}\right]_{12406985} = \left[\begin{array}{cccc} 1 & 0 & 37 & 46 \\ 0 & 1 & 36 & 47 \end{array}\right]_{12406985} = \mathbf{Pl}(46,36,11,37,46,1)_{12388119}$$

$$\ell_{18} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{27} & \epsilon^{54} \\ 0 & 1 & \epsilon^{45} & \epsilon^{36} \end{array}\right]_{2856787} = \left[\begin{array}{cccc} 1 & 0 & 46 & 10 \\ 0 & 1 & 37 & 36 \end{array}\right]_{2856787} = \mathbf{Pl}(37,11,36,46,47,1)_{12747147}$$

$$\ell_{19} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{9} & \epsilon^{54} \\ 0 & 1 & \epsilon^{27} & \epsilon^{18} \end{array}\right]_{2859357} = \left[\begin{array}{cccc} 1 & 0 & 47 & 10 \\ 0 & 1 & 46 & 11 \end{array}\right]_{2859357} = \mathbf{Pl}(46,36,11,37,47,1)_{12647868}$$

$$\ell_{20} = \left[\begin{array}{cccc} 1 & 0 & \epsilon^{18} & \epsilon^{45} \\ 0 & 1 & \epsilon^{9} & \epsilon^{9} \end{array}\right]_{9902074} = \left[\begin{array}{cccc} 1 & 0 & 11 & 37 \\ 0 & 1 & 47 & 47 \end{array}\right]_{9902074} = \mathbf{Pl}(37,11,36,46,10,1)_{3050817}$$

Rank of lines: (3008, 704, 2304, 17046511, 17044171, 17045796, 7170, 4866, 6466, 2855197, 9897912, 9901333, 12400495, 12402825, 2860947, 9897173, 12404655, 12406985, 2856787, 2859357, 9902074)
Rank of points on Klein quadric: (4235, 4262, 4271, 270511, 270475, 270500, 12592896, 3159744, 9712320, 3048585, 3355935, 3312303, 10167684, 9907863, 12387453, 10169313, 9765015, 12388119, 12747147, 12647868, 3050817)

Eckardt Points

The surface has 3 Eckardt points:
$0 : P_0 = \mathbf{P}(1,0,0,0) = \mathbf{P}(1,0,0,0)$,
$1 : P_2 = \mathbf{P}(0,0,1,0) = \mathbf{P}(0,0,1,0)$,
$2 : P_{68} = \mathbf{P}(1,0,1,0) = \mathbf{P}(1,0,1,0)$.

Double Points

The surface has 66 Double points:
The double points on the surface are:

$P_{4802} = (0,10,0,1) = \ell_0 \cap \ell_3$
$P_{4812} = (10,10,0,1) = \ell_0 \cap \ell_6$
$P_{4838} = (36,10,0,1) = \ell_0 \cap \ell_9$
$P_{4848} = (46,10,0,1) = \ell_0 \cap \ell_{11}$
$P_{4813} = (11,10,0,1) = \ell_0 \cap \ell_{14}$
$P_{4803} = (1,10,0,1) = \ell_0 \cap \ell_{16}$
$P_{6530} = (0,37,0,1) = \ell_1 \cap \ell_4$
$P_{6567} = (37,37,0,1) = \ell_1 \cap \ell_7$
$P_{6540} = (10,37,0,1) = \ell_1 \cap \ell_{13}$
$P_{6577} = (47,37,0,1) = \ell_1 \cap \ell_{15}$
$P_{6531} = (1,37,0,1) = \ell_1 \cap \ell_{18}$
$P_{6566} = (36,37,0,1) = \ell_1 \cap \ell_{20}$
$P_{7106} = (0,46,0,1) = \ell_2 \cap \ell_5$
$P_{7152} = (46,46,0,1) = \ell_2 \cap \ell_8$
$P_{7107} = (1,46,0,1) = \ell_2 \cap \ell_{10}$
$P_{7153} = (47,46,0,1) = \ell_2 \cap \ell_{12}$
$P_{7117} = (11,46,0,1) = \ell_2 \cap \ell_{17}$
$P_{7143} = (37,46,0,1) = \ell_2 \cap \ell_{19}$
$P_{45761} = (0,10,10,1) = \ell_3 \cap \ell_6$
$P_{49857} = (0,10,11,1) = \ell_3 \cap \ell_{10}$
$P_{152257} = (0,10,36,1) = \ell_3 \cap \ell_{13}$
$P_{193217} = (0,10,46,1) = \ell_3 \cap \ell_{17}$
$P_{8897} = (0,10,1,1) = \ell_3 \cap \ell_{20}$
$P_{158081} = (0,37,37,1) = \ell_4 \cap \ell_7$
$P_{47489} = (0,37,10,1) = \ell_4 \cap \ell_9$
$P_{10625} = (0,37,1,1) = \ell_4 \cap \ell_{12}$
$P_{153985} = (0,37,36,1) = \ell_4 \cap \ell_{16}$
$P_{199041} = (0,37,47,1) = \ell_4 \cap \ell_{19}$
$P_{195521} = (0,46,46,1) = \ell_5 \cap \ell_8$
$P_{52161} = (0,46,11,1) = \ell_5 \cap \ell_{11}$
$P_{11201} = (0,46,1,1) = \ell_5 \cap \ell_{14}$
$P_{158657} = (0,46,37,1) = \ell_5 \cap \ell_{15}$
$P_{199617} = (0,46,47,1) = \ell_5 \cap \ell_{18}$
$P_{49858} = (1,10,11,1) = \ell_6 \cap \ell_{12}$
$P_{152303} = (46,10,36,1) = \ell_6 \cap \ell_{15}$
$P_{8908} = (11,10,1,1) = \ell_6 \cap \ell_{18}$
$P_{193253} = (36,10,46,1) = \ell_6 \cap \ell_{19}$
$P_{10661} = (36,37,1,1) = \ell_7 \cap \ell_{10}$
$P_{47536} = (47,37,10,1) = \ell_7 \cap \ell_{11}$
$P_{153986} = (1,37,36,1) = \ell_7 \cap \ell_{14}$
$P_{199051} = (10,37,47,1) = \ell_7 \cap \ell_{17}$
$P_{52198} = (37,46,11,1) = \ell_8 \cap \ell_9$
$P_{158668} = (11,46,37,1) = \ell_8 \cap \ell_{13}$
$P_{11248} = (47,46,1,1) = \ell_8 \cap \ell_{16}$
$P_{199618} = (1,46,47,1) = \ell_8 \cap \ell_{20}$
$P_{808} = (37,11,1,0) = \ell_9 \cap \ell_{10}$
$P_{151664} = (47,0,36,1) = \ell_9 \cap \ell_{18}$
$P_{153931} = (10,36,36,1) = \ell_{10} \cap \ell_{12}$
$P_{193327} = (46,11,46,1) = \ell_{10} \cap \ell_{14}$
$P_{196684} = (11,0,47,1) = \ell_{10} \cap \ell_{15}$
$P_{158768} = (47,47,37,1) = \ell_{10} \cap \ell_{20}$
$P_{818} = (47,11,1,0) = \ell_{11} \cap \ell_{12}$
$P_{151628} = (11,0,36,1) = \ell_{11} \cap \ell_{20}$
$P_{196709} = (36,0,47,1) = \ell_{12} \cap \ell_{13}$
$P_{193292} = (11,11,46,1) = \ell_{12} \cap \ell_{16}$
$P_{158758} = (37,47,37,1) = \ell_{12} \cap \ell_{18}$
$P_{2382} = (11,36,1,0) = \ell_{13} \cap \ell_{14}$
$P_{199718} = (37,47,47,1) = \ell_{14} \cap \ell_{16}$
$P_{47461} = (36,36,10,1) = \ell_{14} \cap \ell_{18}$
$P_{49264} = (47,0,11,1) = \ell_{14} \cap \ell_{19}$
$P_{2417} = (46,36,1,0) = \ell_{15} \cap \ell_{16}$
$P_{49253} = (36,0,11,1) = \ell_{16} \cap \ell_{17}$
$P_{47435} = (10,36,10,1) = \ell_{16} \cap \ell_{20}$
$P_{3085} = (10,47,1,0) = \ell_{17} \cap \ell_{18}$
$P_{49967} = (46,11,11,1) = \ell_{18} \cap \ell_{20}$
$P_{3111} = (36,47,1,0) = \ell_{19} \cap \ell_{20}$

Single Points

The surface has 1218 single points:
Too many to print.

Points on surface but on no line

The surface has 3193 points not on any line:
Too many to print.

Line Intersection Graph

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0	0	1	1	1	0	0	1	0	0	1	0	1	0	0	1	0	1	0	0	0	0
1	1	0	1	0	1	0	0	1	0	0	0	0	0	1	0	1	0	0	1	0	1
2	1	1	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	1	0	1	0
3	1	0	0	0	1	1	1	0	0	0	1	0	0	1	0	0	0	1	0	0	1
4	0	1	0	1	0	1	0	1	0	1	0	0	1	0	0	0	1	0	0	1	0
5	0	0	1	1	1	0	0	0	1	0	0	1	0	0	1	1	0	0	1	0	0
6	1	0	0	1	0	0	0	1	1	0	0	0	1	0	0	1	0	0	1	1	0
7	0	1	0	0	1	0	1	0	1	0	1	1	0	0	1	0	0	1	0	0	0
8	0	0	1	0	0	1	1	1	0	1	0	0	0	1	0	0	1	0	0	0	1
9	1	0	0	0	1	0	0	0	1	0	1	1	0	1	0	1	0	1	1	1	0
10	0	0	1	1	0	0	0	1	0	1	0	0	1	0	1	1	0	0	0	0	1
11	1	0	0	0	0	1	0	1	0	1	0	0	1	1	0	1	0	1	0	1	1
12	0	0	1	0	1	0	1	0	0	0	1	1	0	1	0	0	1	0	1	0	0
13	0	1	0	1	0	0	0	0	1	1	0	1	1	0	1	1	0	1	0	1	0
14	1	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	1	1	0
15	0	1	0	0	0	1	1	0	0	1	1	1	0	1	0	0	1	1	0	1	0
16	1	0	0	0	1	0	0	0	1	0	0	0	1	0	1	1	0	1	0	0	1
17	0	0	1	1	0	0	0	1	0	1	0	1	0	1	0	1	1	0	1	1	0
18	0	1	0	0	0	1	1	0	0	1	0	0	1	0	1	0	0	1	0	0	1
19	0	0	1	0	1	0	1	0	1	0	0	1	0	1	1	1	0	1	0	0	1
20	0	1	0	1	0	0	0	0	1	0	1	1	0	0	0	0	1	0	1	1	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_2	ℓ_3	ℓ_6	ℓ_9	ℓ_{11}	ℓ_{14}	ℓ_{16}
in point	P_0	P_0	P_{4802}	P_{4812}	P_{4838}	P_{4848}	P_{4813}	P_{4803}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_7	ℓ_{13}	ℓ_{15}	ℓ_{18}	ℓ_{20}
in point	P_0	P_0	P_{6530}	P_{6567}	P_{6540}	P_{6577}	P_{6531}	P_{6566}

Line 2 intersects

Line	ℓ_0	ℓ_1	ℓ_5	ℓ_8	ℓ_{10}	ℓ_{12}	ℓ_{17}	ℓ_{19}
in point	P_0	P_0	P_{7106}	P_{7152}	P_{7107}	P_{7153}	P_{7117}	P_{7143}

Line 3 intersects

Line	ℓ_0	ℓ_4	ℓ_5	ℓ_6	ℓ_{10}	ℓ_{13}	ℓ_{17}	ℓ_{20}
in point	P_{4802}	P_2	P_2	P_{45761}	P_{49857}	P_{152257}	P_{193217}	P_{8897}

Line 4 intersects

Line	ℓ_1	ℓ_3	ℓ_5	ℓ_7	ℓ_9	ℓ_{12}	ℓ_{16}	ℓ_{19}
in point	P_{6530}	P_2	P_2	P_{158081}	P_{47489}	P_{10625}	P_{153985}	P_{199041}

Line 5 intersects

Line	ℓ_2	ℓ_3	ℓ_4	ℓ_8	ℓ_{11}	ℓ_{14}	ℓ_{15}	ℓ_{18}
in point	P_{7106}	P_2	P_2	P_{195521}	P_{52161}	P_{11201}	P_{158657}	P_{199617}

Line 6 intersects

Line	ℓ_0	ℓ_3	ℓ_7	ℓ_8	ℓ_{12}	ℓ_{15}	ℓ_{18}	ℓ_{19}
in point	P_{4812}	P_{45761}	P_{68}	P_{68}	P_{49858}	P_{152303}	P_{8908}	P_{193253}

Line 7 intersects

Line	ℓ_1	ℓ_4	ℓ_6	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{14}	ℓ_{17}
in point	P_{6567}	P_{158081}	P_{68}	P_{68}	P_{10661}	P_{47536}	P_{153986}	P_{199051}

Line 8 intersects

Line	ℓ_2	ℓ_5	ℓ_6	ℓ_7	ℓ_9	ℓ_{13}	ℓ_{16}	ℓ_{20}
in point	P_{7152}	P_{195521}	P_{68}	P_{68}	P_{52198}	P_{158668}	P_{11248}	P_{199618}

Line 9 intersects

Line	ℓ_0	ℓ_4	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{15}	ℓ_{17}	ℓ_{18}	ℓ_{19}
in point	P_{4838}	P_{47489}	P_{52198}	P_{808}	P_4	P_4	P_4	P_4	P_{151664}	P_4

Line 10 intersects

Line	ℓ_2	ℓ_3	ℓ_7	ℓ_9	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{20}
in point	P_{7107}	P_{49857}	P_{10661}	P_{808}	P_{153931}	P_{193327}	P_{196684}	P_{158768}

Line 11 intersects

Line	ℓ_0	ℓ_5	ℓ_7	ℓ_9	ℓ_{12}	ℓ_{13}	ℓ_{15}	ℓ_{17}	ℓ_{19}	ℓ_{20}
in point	P_{4848}	P_{52161}	P_{47536}	P_4	P_{818}	P_4	P_4	P_4	P_4	P_{151628}

Line 12 intersects

Line	ℓ_2	ℓ_4	ℓ_6	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{16}	ℓ_{18}
in point	P_{7153}	P_{10625}	P_{49858}	P_{153931}	P_{818}	P_{196709}	P_{193292}	P_{158758}

Line 13 intersects

Line	ℓ_1	ℓ_3	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{17}	ℓ_{19}
in point	P_{6540}	P_{152257}	P_{158668}	P_4	P_4	P_{196709}	P_{2382}	P_4	P_4	P_4

Line 14 intersects

Line	ℓ_0	ℓ_5	ℓ_7	ℓ_{10}	ℓ_{13}	ℓ_{16}	ℓ_{18}	ℓ_{19}
in point	P_{4813}	P_{11201}	P_{153986}	P_{193327}	P_{2382}	P_{199718}	P_{47461}	P_{49264}

Line 15 intersects

Line	ℓ_1	ℓ_5	ℓ_6	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{13}	ℓ_{16}	ℓ_{17}	ℓ_{19}
in point	P_{6577}	P_{158657}	P_{152303}	P_4	P_{196684}	P_4	P_4	P_{2417}	P_4	P_4

Line 16 intersects

Line	ℓ_0	ℓ_4	ℓ_8	ℓ_{12}	ℓ_{14}	ℓ_{15}	ℓ_{17}	ℓ_{20}
in point	P_{4803}	P_{153985}	P_{11248}	P_{193292}	P_{199718}	P_{2417}	P_{49253}	P_{47435}

Line 17 intersects

Line	ℓ_2	ℓ_3	ℓ_7	ℓ_9	ℓ_{11}	ℓ_{13}	ℓ_{15}	ℓ_{16}	ℓ_{18}	ℓ_{19}
in point	P_{7117}	P_{193217}	P_{199051}	P_4	P_4	P_4	P_4	P_{49253}	P_{3085}	P_4

Line 18 intersects

Line	ℓ_1	ℓ_5	ℓ_6	ℓ_9	ℓ_{12}	ℓ_{14}	ℓ_{17}	ℓ_{20}
in point	P_{6531}	P_{199617}	P_{8908}	P_{151664}	P_{158758}	P_{47461}	P_{3085}	P_{49967}

Line 19 intersects

Line	ℓ_2	ℓ_4	ℓ_6	ℓ_9	ℓ_{11}	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{17}	ℓ_{20}
in point	P_{7143}	P_{199041}	P_{193253}	P_4	P_4	P_4	P_{49264}	P_4	P_4	P_{3111}

Line 20 intersects

Line	ℓ_1	ℓ_3	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{16}	ℓ_{18}	ℓ_{19}
in point	P_{6566}	P_{8897}	P_{199618}	P_{158768}	P_{151628}	P_{47435}	P_{49967}	P_{3111}

The surface has 4481 points:
Too many to print.