Rank-65921 over GF(64)

January 15, 2021

The equation

The equation of the surface is :

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

(0, 1, 1, 1, 1, 1, 1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(64) is -2113396603

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:

$0: \ P_{8259} = \mathbf{P}(1,0,1,1) = \mathbf{P}(1,0,1,1)$

The 21 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{64} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{64} = \mathbf{Pl}(1,0,0,0,1,0)_{4226}$$

$$\ell_1 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{4097} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{4097} = \mathbf{Pl}(0,0,1,0,1,0)_{4352}$$

$$\ell_2 = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{8258} = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{8258} = \mathbf{Pl}(0,0,1,1,1,1)_{544578}$$

$$\ell_3 = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{270530} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{270530} = \mathbf{Pl}(1,0,1,1,1,1)_{544579}$$

$$\ell_4 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{266369} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 1 \end{bmatrix}_{266369} = \mathbf{Pl}(1,1,1,1,1,0)_{20354}$$

$$\ell_5 = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{270529} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{270529} = \mathbf{Pl}(1,1,0,1,1,1)_{540609}$$

$$\ell_6 = \begin{bmatrix} 1 & 0 & \epsilon^{18} & \epsilon^{9} \\ 0 & 1 & \epsilon^{9} & 0 \end{bmatrix}_{12562106} = \begin{bmatrix} 1 & 0 & 11 & 47 \\ 0 & 1 & 47 & 0 \end{bmatrix}_{12562106} = \mathbf{Pl}(1,1,10,10,0,1)_{322818}$$

$$\ell_7 = \begin{bmatrix} 1 & 0 & \epsilon^{18} & \epsilon^{18} \\ 0 & 1 & \epsilon^{9} & 0 \end{bmatrix}_{2975162} = \begin{bmatrix} 1 & 0 & 11 & 11 \\ 0 & 1 & 47 & 0 \end{bmatrix}_{2975162} = \mathbf{Pl}(10,47,10,1,0,1)_{287106}$$

$$\ell_8 = \begin{bmatrix} 1 & 0 & \epsilon^{18} & \epsilon^{36} \\ 0 & 1 & \epsilon^{9} & 0 \end{bmatrix}_{9632762} = \begin{bmatrix} 1 & 0 & 11 & 36 \\ 0 & 1 & 47 & 0 \end{bmatrix}_{9632762} = \mathbf{Pl}(36,46,10,11,0,1)_{326822}$$

$$\ell_9 = \begin{bmatrix} 1 & 0 & \epsilon^{18} & \epsilon^{9} \\ 0 & 1 & \epsilon^{27} & \epsilon^{54} \end{bmatrix}_{12562745} = \begin{bmatrix} 1 & 0 & 11 & 47 \\ 0 & 1 & 46 & 10 \end{bmatrix}_{12562745} = \mathbf{Pl}(1,1,47,10,36,1)_{9907827}$$

$$\ell_{10} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & \epsilon^{54} & \epsilon^{45} \end{bmatrix}_{272843} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 10 & 37 \end{bmatrix}_{272843} = \mathbf{Pl}(10,47,1,1,37,1)_{9990303}$$

$$\ell_{11} = \begin{bmatrix} 1 & 0 & \epsilon^{36} & \epsilon^{18} \\ 0 & 1 & \epsilon^{18} & 0 \end{bmatrix}_{3079151} = \begin{bmatrix} 1 & 0 & 36 & 11 \\ 0 & 1 & 11 & 0 \end{bmatrix}_{3079151} = \mathbf{Pl}(1,1,37,37,0,1)_{431682}$$

$$\ell_{12} = \begin{bmatrix} 1 & 0 & \epsilon^{36} & \epsilon^{36} \\ 0 & 1 & \epsilon^{18} & 0 \end{bmatrix}_{9736751} = \begin{bmatrix} 1 & 0 & 36 & 36 \\ 0 & 1 & 11 & 0 \end{bmatrix}_{9736751} = \mathbf{Pl}(37,11,37,1,0,1)_{288834}$$

$$\ell_{13} = \begin{bmatrix} 1 & 0 & \epsilon^{36} & \epsilon^{9} \\ 0 & 1 & \epsilon^{18} & 0 \end{bmatrix}_{12666095} = \begin{bmatrix} 1 & 0 & 36 & 47 \\ 0 & 1 & 11 & 0 \end{bmatrix}_{12666095} = \mathbf{Pl}(47,10,37,36,0,1)_{427759}$$

$$\ell_{14} = \begin{bmatrix} 1 & 0 & \epsilon^{36} & \epsilon^{18} \\ 0 & 1 & \epsilon^{54} & \epsilon^{45} \end{bmatrix}_{3081518} = \begin{bmatrix} 1 & 0 & 36 & 11 \\ 0 & 1 & 10 & 37 \end{bmatrix}_{3081518} = \mathbf{Pl}(1,1,11,37,47,1)_{12647823}$$

$$\ell_{15} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & \epsilon^{45} & \epsilon^{27} \end{bmatrix}_{273446} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 37 & 46 \end{bmatrix}_{273446} = \mathbf{Pl}(37,11,1,1,46,1)_{12346782}$$

$$\ell_{16} = \begin{bmatrix} 1 & 0 & \epsilon^{9} & \epsilon^{36} \\ 0 & 1 & \epsilon^{36} & 0 \end{bmatrix}_{9782547} = \begin{bmatrix} 1 & 0 & 47 & 36 \\ 0 & 1 & 36 & 0 \end{bmatrix}_{9782547} = \mathbf{Pl}(1,1,46,46,0,1)_{467970}$$

$$\ell_{17} = \begin{bmatrix} 1 & 0 & \epsilon^{9} & \epsilon^{18} \\ 0 & 1 & \epsilon^{36} & 0 \end{bmatrix}_{3124947} = \begin{bmatrix} 1 & 0 & 47 & 11 \\ 0 & 1 & 36 & 0 \end{bmatrix}_{3124947} = \mathbf{Pl}(11,37,46,47,0,1)_{471949}$$

$$\ell_{18} = \begin{bmatrix} 1 & 0 & \epsilon^{9} & \epsilon^{9} \\ 0 & 1 & \epsilon^{36} & 0 \end{bmatrix}_{12711891} = \begin{bmatrix} 1 & 0 & 47 & 47 \\ 0 & 1 & 36 & 0 \end{bmatrix}_{12711891} = \mathbf{Pl}(46,36,46,1,0,1)_{289410}$$

$$\ell_{19} = \begin{bmatrix} 1 & 0 & \epsilon^{9} & \epsilon^{36} \\ 0 & 1 & \epsilon^{45} & \epsilon^{27} \end{bmatrix}_{9785492} = \begin{bmatrix} 1 & 0 & 47 & 36 \\ 0 & 1 & 37 & 46 \end{bmatrix}_{9785492} = \mathbf{Pl}(1,1,36,46,11,1)_{3312294}$$

$$\ell_{20} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & \epsilon^{27} & \epsilon^{54} \end{bmatrix}_{271151} = \begin{bmatrix} 1 & 0 & 1 & 1 \\ 0 & 1 & 46 & 10 \end{bmatrix}_{271151} = \mathbf{Pl}(46,36,1,1,10,1)_{2913486}$$

Rank of lines: (64, 4097, 8258, 270530, 266369, 270529, 12562106, 2975162, 9632762, 12562745, 272843, 3079151, 9736751, 12666095, 3081518, 273446, 9782547, 3124947, 12711891, 9785492, 271151)
Rank of points on Klein quadric: (4226, 4352, 544578, 544579, 20354, 540609, 322818, 287106, 326822, 9907827, 9990303, 431682, 288834, 427759, 12647823, 12346782, 467970, 471949, 289410, 3312294, 2913486)

Eckardt Points

The surface has 3 Eckardt points:
$0 : P_{707} = \mathbf{P}(0, \epsilon^{54}, 1, 0) = \mathbf{P}(0, 10, 1, 0)$,
$1 : P_{2435} = \mathbf{P}(0, \epsilon^{45}, 1, 0) = \mathbf{P}(0, 37, 1, 0)$,
$2 : P_{3011} = \mathbf{P}(0, \epsilon^{27}, 1, 0) = \mathbf{P}(0, 46, 1, 0)$.

Double Points

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

$P_0 = (1, 0, 0, 0) = \ell_0 \cap \ell_1$
$P_{4226} = (0, 1, 0, 1) = \ell_0 \cap \ell_5$
$P_{4236} = (10, 1, 0, 1) = \ell_0 \cap \ell_6$
$P_{4273} = (47, 1, 0, 1) = \ell_0 \cap \ell_9$
$P_{4263} = (37, 1, 0, 1) = \ell_0 \cap \ell_{11}$
$P_{4237} = (11, 1, 0, 1) = \ell_0 \cap \ell_{14}$
$P_{4272} = (46, 1, 0, 1) = \ell_0 \cap \ell_{16}$
$P_{4262} = (36, 1, 0, 1) = \ell_0 \cap \ell_{19}$
$P_{8258} = (0, 0, 1, 1) = \ell_1 \cap \ell_2$
$P_{8295} = (37, 0, 1, 1) = \ell_1 \cap \ell_7$
$P_{8304} = (46, 0, 1, 1) = \ell_1 \cap \ell_{12}$
$P_{8268} = (10, 0, 1, 1) = \ell_1 \cap \ell_{18}$
$P_5 = (1, 1, 0, 0) = \ell_2 \cap \ell_3$
$P_{11247} = (46, 46, 1, 1) = \ell_2 \cap \ell_8$
$P_{8972} = (11, 11, 1, 1) = \ell_2 \cap \ell_9$
$P_{8907} = (10, 10, 1, 1) = \ell_2 \cap \ell_{13}$
$P_{10597} = (36, 36, 1, 1) = \ell_2 \cap \ell_{14}$
$P_{10662} = (37, 37, 1, 1) = \ell_2 \cap \ell_{17}$
$P_{11312} = (47, 47, 1, 1) = \ell_2 \cap \ell_{19}$
$P_{8322} = (0, 1, 1, 1) = \ell_3 \cap \ell_4$
$P_{8971} = (10, 11, 1, 1) = \ell_3 \cap \ell_6$
$P_{10598} = (37, 36, 1, 1) = \ell_3 \cap \ell_{11}$
$P_{11311} = (46, 47, 1, 1) = \ell_3 \cap \ell_{16}$
$P_{132} = (1, 1, 1, 0) = \ell_4 \cap \ell_5$
$P_{153958} = (37, 36, 36, 1) = \ell_4 \cap \ell_7$
$P_{158117} = (36, 37, 37, 1) = \ell_4 \cap \ell_9$
$P_{199727} = (46, 47, 47, 1) = \ell_4 \cap \ell_{12}$
$P_{195568} = (47, 46, 46, 1) = \ell_4 \cap \ell_{14}$
$P_{49931} = (10, 11, 11, 1) = \ell_4 \cap \ell_{18}$
$P_{45772} = (11, 10, 10, 1) = \ell_4 \cap \ell_{19}$
$P_{195631} = (46, 47, 46, 1) = \ell_5 \cap \ell_8$
$P_{45835} = (10, 11, 10, 1) = \ell_5 \cap \ell_{13}$
$P_{158054} = (37, 36, 37, 1) = \ell_5 \cap \ell_{17}$
$P_{196683} = (10, 0, 47, 1) = \ell_6 \cap \ell_9$
$P_{52171} = (10, 46, 11, 1) = \ell_6 \cap \ell_{13}$
$P_{193227} = (10, 10, 46, 1) = \ell_6 \cap \ell_{15}$
$P_{154635} = (10, 47, 36, 1) = \ell_6 \cap \ell_{18}$
$P_{4839} = (37, 10, 0, 1) = \ell_7 \cap \ell_{10}$
$P_{197414} = (37, 11, 47, 1) = \ell_7 \cap \ell_{11}$
$P_{192678} = (37, 1, 46, 1) = \ell_7 \cap \ell_{17}$
$P_{158694} = (37, 46, 37, 1) = \ell_7 \cap \ell_{19}$
$P_{45231} = (46, 1, 10, 1) = \ell_8 \cap \ell_{12}$
$P_{152303} = (46, 10, 36, 1) = \ell_8 \cap \ell_{14}$
$P_{199087} = (46, 37, 47, 1) = \ell_8 \cap \ell_{16}$
$P_{49967} = (46, 11, 11, 1) = \ell_8 \cap \ell_{20}$
$P_{743} = (36, 10, 1, 0) = \ell_9 \cap \ell_{10}$
$P_{193263} = (46, 10, 46, 1) = \ell_9 \cap \ell_{12}$
$P_{52198} = (37, 46, 11, 1) = \ell_9 \cap \ell_{17}$
$P_{154625} = (0, 47, 36, 1) = \ell_9 \cap \ell_{20}$
$P_{153931} = (10, 36, 36, 1) = \ell_{10} \cap \ell_{13}$
$P_{197377} = (0, 11, 47, 1) = \ell_{10} \cap \ell_{14}$
$P_{158703} = (46, 46, 37, 1) = \ell_{10} \cap \ell_{16}$
$P_{49254} = (37, 0, 11, 1) = \ell_{11} \cap \ell_{14}$
$P_{152294} = (37, 10, 36, 1) = \ell_{11} \cap \ell_{17}$
$P_{47526} = (37, 37, 10, 1) = \ell_{11} \cap \ell_{20}$
$P_{6576} = (46, 37, 0, 1) = \ell_{12} \cap \ell_{15}$
$P_{51567} = (46, 36, 11, 1) = \ell_{12} \cap \ell_{16}$
$P_{155787} = (10, 1, 37, 1) = \ell_{13} \cap \ell_{18}$
$P_{199051} = (10, 37, 47, 1) = \ell_{13} \cap \ell_{19}$
$P_{2482} = (47, 37, 1, 0) = \ell_{14} \cap \ell_{15}$
$P_{47499} = (10, 37, 10, 1) = \ell_{14} \cap \ell_{18}$
$P_{199718} = (37, 47, 47, 1) = \ell_{15} \cap \ell_{17}$
$P_{51521} = (0, 36, 11, 1) = \ell_{15} \cap \ell_{19}$
$P_{151663} = (46, 0, 36, 1) = \ell_{16} \cap \ell_{19}$
$P_{7116} = (10, 46, 0, 1) = \ell_{18} \cap \ell_{20}$
$P_{3022} = (11, 46, 1, 0) = \ell_{19} \cap \ell_{20}$

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line	ℓ_1	ℓ_5	ℓ_6	ℓ_9	ℓ_{11}	ℓ_{14}	ℓ_{16}	ℓ_{19}
in point	P_0	P_{4226}	P_{4236}	P_{4273}	P_{4263}	P_{4237}	P_{4272}	P_{4262}

Line 1 intersects

Line	ℓ_0	ℓ_2	ℓ_3	ℓ_5	ℓ_7	ℓ_{10}	ℓ_{12}	ℓ_{15}	ℓ_{18}	ℓ_{20}
in point	P_0	P_{8258}	P_{8259}	P_{8259}	P_{8295}	P_{8259}	P_{8304}	P_{8259}	P_{8268}	P_{8259}

Line 2 intersects

Line	ℓ_1	ℓ_3	ℓ_8	ℓ_9	ℓ_{13}	ℓ_{14}	ℓ_{17}	ℓ_{19}
in point	P_{8258}	P_5	P_{11247}	P_{8972}	P_{8907}	P_{10597}	P_{10662}	P_{11312}

Line 3 intersects

Line	ℓ_1	ℓ_2	ℓ_4	ℓ_5	ℓ_6	ℓ_{10}	ℓ_{11}	ℓ_{15}	ℓ_{16}	ℓ_{20}
in point	P_{8259}	P_5	P_{8322}	P_{8259}	P_{8971}	P_{8259}	P_{10598}	P_{8259}	P_{11311}	P_{8259}

Line 4 intersects

Line	ℓ_3	ℓ_5	ℓ_7	ℓ_9	ℓ_{12}	ℓ_{14}	ℓ_{18}	ℓ_{19}
in point	P_{8322}	P_{132}	P_{153958}	P_{158117}	P_{199727}	P_{195568}	P_{49931}	P_{45772}

Line 5 intersects

Line	ℓ_0	ℓ_1	ℓ_3	ℓ_4	ℓ_8	ℓ_{10}	ℓ_{13}	ℓ_{15}	ℓ_{17}	ℓ_{20}
in point	P_{4226}	P_{8259}	P_{8259}	P_{132}	P_{195631}	P_{8259}	P_{45835}	P_{8259}	P_{158054}	P_{8259}

Line 6 intersects

Line	ℓ_0	ℓ_3	ℓ_7	ℓ_8	ℓ_9	ℓ_{13}	ℓ_{15}	ℓ_{18}
in point	P_{4236}	P_{8971}	P_{707}	P_{707}	P_{196683}	P_{52171}	P_{193227}	P_{154635}

Line 7 intersects

Line	ℓ_1	ℓ_4	ℓ_6	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{17}	ℓ_{19}
in point	P_{8295}	P_{153958}	P_{707}	P_{707}	P_{4839}	P_{197414}	P_{192678}	P_{158694}

Line 8 intersects

Line	ℓ_2	ℓ_5	ℓ_6	ℓ_7	ℓ_{12}	ℓ_{14}	ℓ_{16}	ℓ_{20}
in point	P_{11247}	P_{195631}	P_{707}	P_{707}	P_{45231}	P_{152303}	P_{199087}	P_{49967}

Line 9 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_6	ℓ_{10}	ℓ_{12}	ℓ_{17}	ℓ_{20}
in point	P_{4273}	P_{8972}	P_{158117}	P_{196683}	P_{743}	P_{193263}	P_{52198}	P_{154625}

Line 10 intersects

Line	ℓ_1	ℓ_3	ℓ_5	ℓ_7	ℓ_9	ℓ_{13}	ℓ_{14}	ℓ_{15}	ℓ_{16}	ℓ_{20}
in point	P_{8259}	P_{8259}	P_{8259}	P_{4839}	P_{743}	P_{153931}	P_{197377}	P_{8259}	P_{158703}	P_{8259}

Line 11 intersects

Line	ℓ_0	ℓ_3	ℓ_7	ℓ_{12}	ℓ_{13}	ℓ_{14}	ℓ_{17}	ℓ_{20}
in point	P_{4263}	P_{10598}	P_{197414}	P_{2435}	P_{2435}	P_{49254}	P_{152294}	P_{47526}

Line 12 intersects

Line	ℓ_1	ℓ_4	ℓ_8	ℓ_9	ℓ_{11}	ℓ_{13}	ℓ_{15}	ℓ_{16}
in point	P_{8304}	P_{199727}	P_{45231}	P_{193263}	P_{2435}	P_{2435}	P_{6576}	P_{51567}

Line 13 intersects

Line	ℓ_2	ℓ_5	ℓ_6	ℓ_{10}	ℓ_{11}	ℓ_{12}	ℓ_{18}	ℓ_{19}
in point	P_{8907}	P_{45835}	P_{52171}	P_{153931}	P_{2435}	P_{2435}	P_{155787}	P_{199051}

Line 14 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_8	ℓ_{10}	ℓ_{11}	ℓ_{15}	ℓ_{18}
in point	P_{4237}	P_{10597}	P_{195568}	P_{152303}	P_{197377}	P_{49254}	P_{2482}	P_{47499}

Line 15 intersects

Line	ℓ_1	ℓ_3	ℓ_5	ℓ_6	ℓ_{10}	ℓ_{12}	ℓ_{14}	ℓ_{17}	ℓ_{19}	ℓ_{20}
in point	P_{8259}	P_{8259}	P_{8259}	P_{193227}	P_{8259}	P_{6576}	P_{2482}	P_{199718}	P_{51521}	P_{8259}

Line 16 intersects

Line	ℓ_0	ℓ_3	ℓ_8	ℓ_{10}	ℓ_{12}	ℓ_{17}	ℓ_{18}	ℓ_{19}
in point	P_{4272}	P_{11311}	P_{199087}	P_{158703}	P_{51567}	P_{3011}	P_{3011}	P_{151663}

Line 17 intersects

Line	ℓ_2	ℓ_5	ℓ_7	ℓ_9	ℓ_{11}	ℓ_{15}	ℓ_{16}	ℓ_{18}
in point	P_{10662}	P_{158054}	P_{192678}	P_{52198}	P_{152294}	P_{199718}	P_{3011}	P_{3011}

Line 18 intersects

Line	ℓ_1	ℓ_4	ℓ_6	ℓ_{13}	ℓ_{14}	ℓ_{16}	ℓ_{17}	ℓ_{20}
in point	P_{8268}	P_{49931}	P_{154635}	P_{155787}	P_{47499}	P_{3011}	P_{3011}	P_{7116}

Line 19 intersects

Line	ℓ_0	ℓ_2	ℓ_4	ℓ_7	ℓ_{13}	ℓ_{15}	ℓ_{16}	ℓ_{20}
in point	P_{4262}	P_{11312}	P_{45772}	P_{158694}	P_{199051}	P_{51521}	P_{151663}	P_{3022}

Line 20 intersects

Line	ℓ_1	ℓ_3	ℓ_5	ℓ_8	ℓ_9	ℓ_{10}	ℓ_{11}	ℓ_{15}	ℓ_{18}	ℓ_{19}
in point	P_{8259}	P_{8259}	P_{8259}	P_{49967}	P_{154625}	P_{8259}	P_{47526}	P_{8259}	P_{7116}	P_{3022}

The surface has 4481 points:
Too many to print.