Rank-65919 over GF(64)

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The equation

The equation of the surface is :

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

(0, 0, 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 -2113396667

General information

Number of lines	1
Number of points	4161
Number of singular points	1
Number of Eckardt points	0
Number of double points	0
Number of single points	65
Number of points off lines	4096
Number of Hesse planes	0
Number of axes	0
Type of points on lines	65
Type of lines on points	$1^{65}, 0^{4096}$

Singular Points

The surface has 1 singular points:

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

The 1 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{4097} = \begin{bmatrix} 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 \end{bmatrix}_{4097} = \mathbf{Pl}(0, 0, 1, 0, 1, 0)_{4352}$$

Rank of lines: (4097)
Rank of points on Klein quadric: (4352)

Eckardt Points

The surface has 0 Eckardt points:

Double Points

The surface has 0 Double points:
The double points on the surface are:

Single Points

The surface has 65 single points:
The single points on the surface are:

0 : $P_0 = (1, 0, 0, 0)$ lies on line ℓ_0
1 : $P_{8258} = (0, 0, 1, 1)$ lies on line ℓ_0
2 : $P_{8259} = (1, 0, 1, 1)$ lies on line ℓ_0
3 : $P_{8260} = (2, 0, 1, 1)$ lies on line ℓ_0
4 : $P_{8261} = (3, 0, 1, 1)$ lies on line ℓ_0
5 : $P_{8262} = (4, 0, 1, 1)$ lies on line ℓ_0
6 : $P_{8263} = (5, 0, 1, 1)$ lies on line ℓ_0
7 : $P_{8264} = (6, 0, 1, 1)$ lies on line ℓ_0
8 : $P_{8265} = (7, 0, 1, 1)$ lies on line ℓ_0
9 : $P_{8266} = (8, 0, 1, 1)$ lies on line ℓ_0
10 : $P_{8267} = (9, 0, 1, 1)$ lies on line ℓ_0
11 : $P_{8268} = (10, 0, 1, 1)$ lies on line ℓ_0
12 : $P_{8269} = (11, 0, 1, 1)$ lies on line ℓ_0
13 : $P_{8270} = (12, 0, 1, 1)$ lies on line ℓ_0
14 : $P_{8271} = (13, 0, 1, 1)$ lies on line ℓ_0
15 : $P_{8272} = (14, 0, 1, 1)$ lies on line ℓ_0
16 : $P_{8273} = (15, 0, 1, 1)$ lies on line ℓ_0
17 : $P_{8274} = (16, 0, 1, 1)$ lies on line ℓ_0
18 : $P_{8275} = (17, 0, 1, 1)$ lies on line ℓ_0
19 : $P_{8276} = (18, 0, 1, 1)$ lies on line ℓ_0
20 : $P_{8277} = (19, 0, 1, 1)$ lies on line ℓ_0
21 : $P_{8278} = (20, 0, 1, 1)$ lies on line ℓ_0
22 : $P_{8279} = (21, 0, 1, 1)$ lies on line ℓ_0
23 : $P_{8280} = (22, 0, 1, 1)$ lies on line ℓ_0
24 : $P_{8281} = (23, 0, 1, 1)$ lies on line ℓ_0
25 : $P_{8282} = (24, 0, 1, 1)$ lies on line ℓ_0
26 : $P_{8283} = (25, 0, 1, 1)$ lies on line ℓ_0
27 : $P_{8284} = (26, 0, 1, 1)$ lies on line ℓ_0
28 : $P_{8285} = (27, 0, 1, 1)$ lies on line ℓ_0
29 : $P_{8286} = (28, 0, 1, 1)$ lies on line ℓ_0
30 : $P_{8287} = (29, 0, 1, 1)$ lies on line ℓ_0
31 : $P_{8288} = (30, 0, 1, 1)$ lies on line ℓ_0
32 : $P_{8289} = (31, 0, 1, 1)$ lies on line ℓ_0

33 : $P_{8290} = (32, 0, 1, 1)$ lies on line ℓ_0
34 : $P_{8291} = (33, 0, 1, 1)$ lies on line ℓ_0
35 : $P_{8292} = (34, 0, 1, 1)$ lies on line ℓ_0
36 : $P_{8293} = (35, 0, 1, 1)$ lies on line ℓ_0
37 : $P_{8294} = (36, 0, 1, 1)$ lies on line ℓ_0
38 : $P_{8295} = (37, 0, 1, 1)$ lies on line ℓ_0
39 : $P_{8296} = (38, 0, 1, 1)$ lies on line ℓ_0
40 : $P_{8297} = (39, 0, 1, 1)$ lies on line ℓ_0
41 : $P_{8298} = (40, 0, 1, 1)$ lies on line ℓ_0
42 : $P_{8299} = (41, 0, 1, 1)$ lies on line ℓ_0
43 : $P_{8300} = (42, 0, 1, 1)$ lies on line ℓ_0
44 : $P_{8301} = (43, 0, 1, 1)$ lies on line ℓ_0
45 : $P_{8302} = (44, 0, 1, 1)$ lies on line ℓ_0
46 : $P_{8303} = (45, 0, 1, 1)$ lies on line ℓ_0
47 : $P_{8304} = (46, 0, 1, 1)$ lies on line ℓ_0
48 : $P_{8305} = (47, 0, 1, 1)$ lies on line ℓ_0
49 : $P_{8306} = (48, 0, 1, 1)$ lies on line ℓ_0
50 : $P_{8307} = (49, 0, 1, 1)$ lies on line ℓ_0
51 : $P_{8308} = (50, 0, 1, 1)$ lies on line ℓ_0
52 : $P_{8309} = (51, 0, 1, 1)$ lies on line ℓ_0
53 : $P_{8310} = (52, 0, 1, 1)$ lies on line ℓ_0
54 : $P_{8311} = (53, 0, 1, 1)$ lies on line ℓ_0
55 : $P_{8312} = (54, 0, 1, 1)$ lies on line ℓ_0
56 : $P_{8313} = (55, 0, 1, 1)$ lies on line ℓ_0
57 : $P_{8314} = (56, 0, 1, 1)$ lies on line ℓ_0
58 : $P_{8315} = (57, 0, 1, 1)$ lies on line ℓ_0
59 : $P_{8316} = (58, 0, 1, 1)$ lies on line ℓ_0
60 : $P_{8317} = (59, 0, 1, 1)$ lies on line ℓ_0
61 : $P_{8318} = (60, 0, 1, 1)$ lies on line ℓ_0
62 : $P_{8319} = (61, 0, 1, 1)$ lies on line ℓ_0
63 : $P_{8320} = (62, 0, 1, 1)$ lies on line ℓ_0
64 : $P_{8321} = (63, 0, 1, 1)$ lies on line ℓ_0

The single points on the surface are:

Points on surface but on no line

The surface has 4096 points not on any line:
Too many to print.

Line Intersection Graph

$$\begin{array}{c|c} & 0 \\ \hline 0 & 0 \end{array}$$

Neighbor sets in the line intersection graph:
Line 0 intersects

Line
in point

The surface has 4161 points:
Too many to print.