Rank-77 over GF(32)

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The equation

The equation of the surface is :

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

(1, 1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)
The point rank of the equation over GF(32) is 2164817

General information

Number of lines	1
Number of points	1057
Number of singular points	0
Number of Eckardt points	0
Number of double points	0
Number of single points	33
Number of points off lines	1024
Number of Hesse planes	0
Number of axes	0
Type of points on lines	33
Type of lines on points	1^{33}, 0^{1024}

Singular Points

The surface has 0 singular points:

The 1 Lines

The lines and their Pluecker coordinates are:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{33825} = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}_{33825} = \mathbf{Pl}(1,1,1,1,0,0)_{128}$$

Rank of lines: (33825)
Rank of points on Klein quadric: (128)

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 33 single points:
The single points on the surface are:

0 : $P_4 = (1,1,1,1)$ lies on line ℓ_0
1 : $P_{67} = (0,1,1,0)$ lies on line ℓ_0
2 : $P_{1059} = (1,0,0,1)$ lies on line ℓ_0
3 : $P_{3170} = (1,2,2,1)$ lies on line ℓ_0
4 : $P_{4226} = (1,3,3,1)$ lies on line ℓ_0
5 : $P_{5282} = (1,4,4,1)$ lies on line ℓ_0
6 : $P_{6338} = (1,5,5,1)$ lies on line ℓ_0
7 : $P_{7394} = (1,6,6,1)$ lies on line ℓ_0
8 : $P_{8450} = (1,7,7,1)$ lies on line ℓ_0
9 : $P_{9506} = (1,8,8,1)$ lies on line ℓ_0
10 : $P_{10562} = (1,9,9,1)$ lies on line ℓ_0
11 : $P_{11618} = (1,10,10,1)$ lies on line ℓ_0
12 : $P_{12674} = (1,11,11,1)$ lies on line ℓ_0
13 : $P_{13730} = (1,12,12,1)$ lies on line ℓ_0
14 : $P_{14786} = (1,13,13,1)$ lies on line ℓ_0
15 : $P_{15842} = (1,14,14,1)$ lies on line ℓ_0
16 : $P_{16898} = (1,15,15,1)$ lies on line ℓ_0
17 : $P_{17954} = (1,16,16,1)$ lies on line ℓ_0
18 : $P_{19010} = (1,17,17,1)$ lies on line ℓ_0
19 : $P_{20066} = (1,18,18,1)$ lies on line ℓ_0
20 : $P_{21122} = (1,19,19,1)$ lies on line ℓ_0
21 : $P_{22178} = (1,20,20,1)$ lies on line ℓ_0
22 : $P_{23234} = (1,21,21,1)$ lies on line ℓ_0
23 : $P_{24290} = (1,22,22,1)$ lies on line ℓ_0
24 : $P_{25346} = (1,23,23,1)$ lies on line ℓ_0
25 : $P_{26402} = (1,24,24,1)$ lies on line ℓ_0
26 : $P_{27458} = (1,25,25,1)$ lies on line ℓ_0
27 : $P_{28514} = (1,26,26,1)$ lies on line ℓ_0
28 : $P_{29570} = (1,27,27,1)$ lies on line ℓ_0
29 : $P_{30626} = (1,28,28,1)$ lies on line ℓ_0
30 : $P_{31682} = (1,29,29,1)$ lies on line ℓ_0
31 : $P_{32738} = (1,30,30,1)$ lies on line ℓ_0
32 : $P_{33794} = (1,31,31,1)$ lies on line ℓ_0

The single points on the surface are:

Points on surface but on no line

The surface has 1024 points not on any line:
Too many to print.

Line Intersection Graph

	0
0	0

Neighbor sets in the line intersection graph:
Line 0 intersects

Line
in point

The surface has 1057 points:
Too many to print.