Rank-65570 over GF(32)

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The equation

The equation of the surface is :

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

(1, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 0, 0, 0)
The point rank of the equation over GF(32) is 1109461062

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:

$$\ell_0 = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{1089} = \begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 1 \end{bmatrix}_{1089} = \mathbf{Pl}(1,1,0,0,1,1)_{68609}$$

Rank of lines: (1089)
Rank of points on Klein quadric: (68609)

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

$1 : P_{36} = (1, 0, 1, 0)$ lies on line ℓ_0

$2 : P_{1090} = (0, 1, 0, 1)$ lies on line ℓ_0

$3 : P_{3139} = (2, 1, 2, 1)$ lies on line ℓ_0

$4 : P_{4164} = (3, 1, 3, 1)$ lies on line ℓ_0

$5 : P_{5189} = (4, 1, 4, 1)$ lies on line ℓ_0

$6 : P_{6214} = (5, 1, 5, 1)$ lies on line ℓ_0

$7 : P_{7239} = (6, 1, 6, 1)$ lies on line ℓ_0

$8 : P_{8264} = (7, 1, 7, 1)$ lies on line ℓ_0

$9 : P_{9289} = (8, 1, 8, 1)$ lies on line ℓ_0

$10 : P_{10314} = (9, 1, 9, 1)$ lies on line ℓ_0

$11 : P_{11339} = (10, 1, 10, 1)$ lies on line ℓ_0

$12 : P_{12364} = (11, 1, 11, 1)$ lies on line ℓ_0

$13 : P_{13389} = (12, 1, 12, 1)$ lies on line ℓ_0

$14 : P_{14414} = (13, 1, 13, 1)$ lies on line ℓ_0

$15 : P_{15439} = (14, 1, 14, 1)$ lies on line ℓ_0

$16 : P_{16464} = (15, 1, 15, 1)$ lies on line ℓ_0

$17 : P_{17489} = (16, 1, 16, 1)$ lies on line ℓ_0

$18 : P_{18514} = (17, 1, 17, 1)$ lies on line ℓ_0

$19 : P_{19539} = (18, 1, 18, 1)$ lies on line ℓ_0

$20 : P_{20564} = (19, 1, 19, 1)$ lies on line ℓ_0

$21 : P_{21589} = (20, 1, 20, 1)$ lies on line ℓ_0

$22 : P_{22614} = (21, 1, 21, 1)$ lies on line ℓ_0

$23 : P_{23639} = (22, 1, 22, 1)$ lies on line ℓ_0

$24 : P_{24664} = (23, 1, 23, 1)$ lies on line ℓ_0

$25 : P_{25689} = (24, 1, 24, 1)$ lies on line ℓ_0

$26 : P_{26714} = (25, 1, 25, 1)$ lies on line ℓ_0

$27 : P_{27739} = (26, 1, 26, 1)$ lies on line ℓ_0

$28 : P_{28764} = (27, 1, 27, 1)$ lies on line ℓ_0

$29 : P_{29789} = (28, 1, 28, 1)$ lies on line ℓ_0

$30 : P_{30814} = (29, 1, 29, 1)$ lies on line ℓ_0

$31 : P_{31839} = (30, 1, 30, 1)$ lies on line ℓ_0

$32 : P_{32864} = (31, 1, 31, 1)$ 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

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

Neighbor sets in the line intersection graph:
Line 0 intersects

Line
in point

The surface has 1057 points:
Too many to print.